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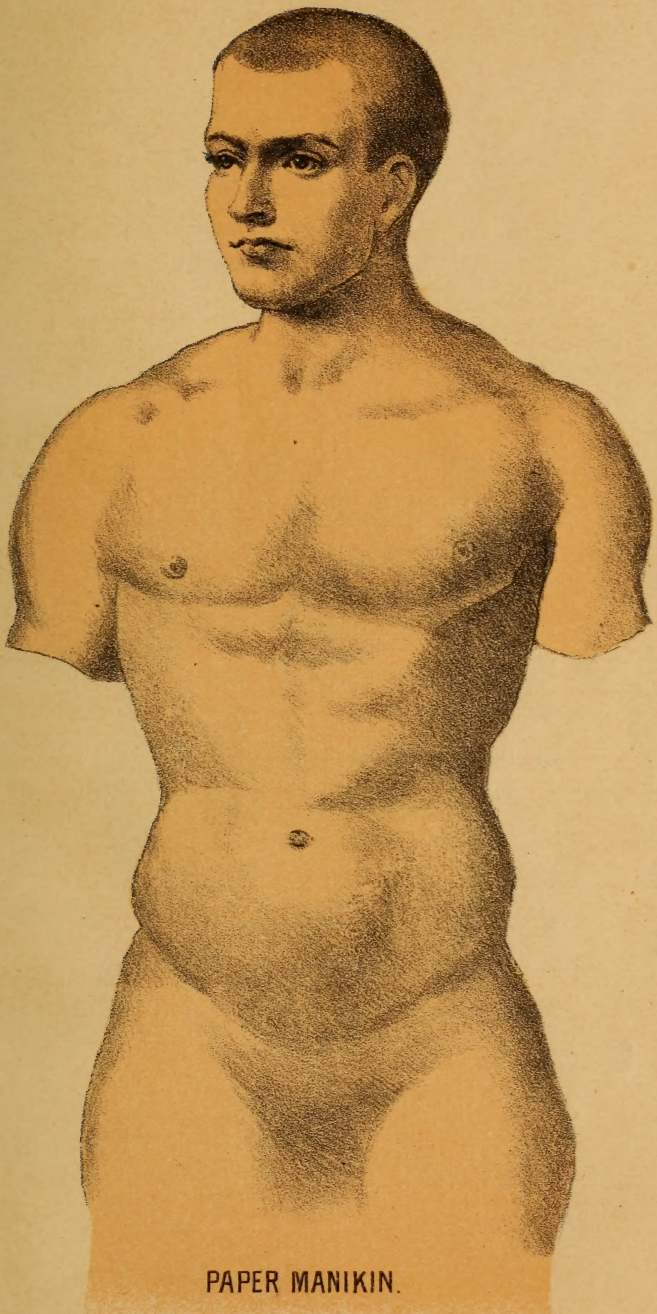

PAPER MANIKIN.

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K. Bronchial Tubes.

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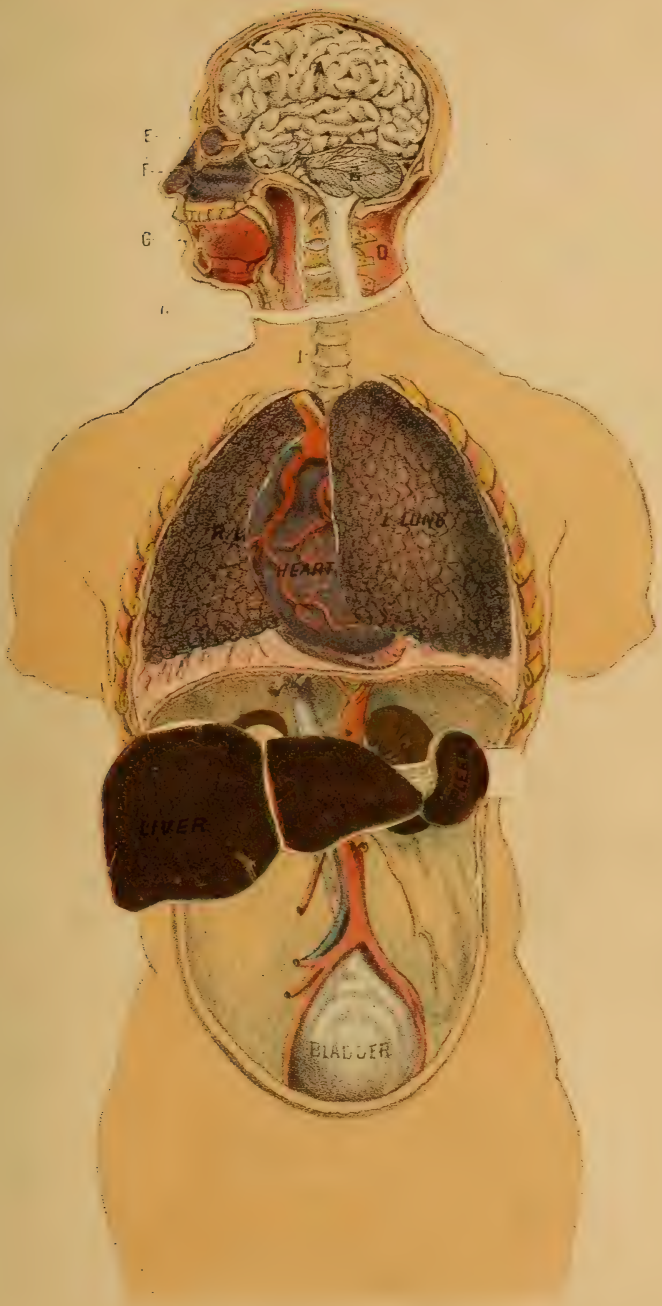
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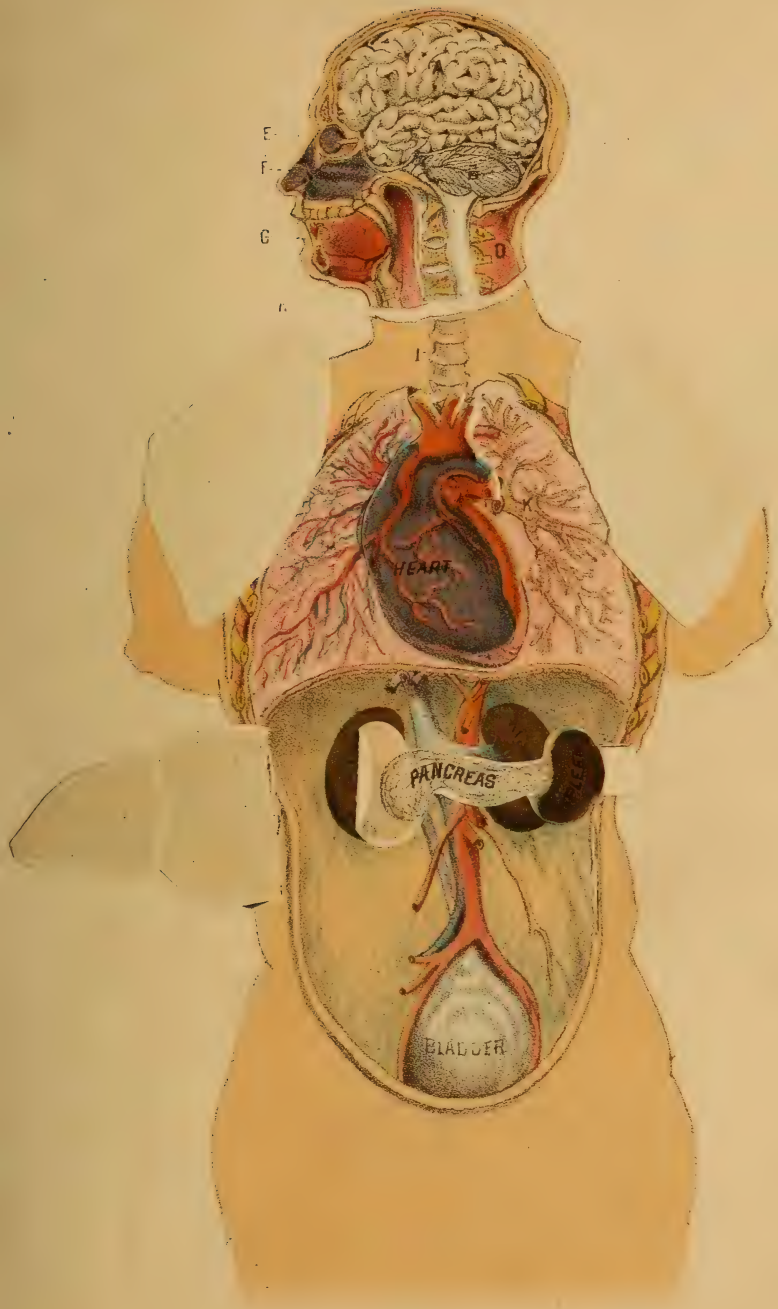
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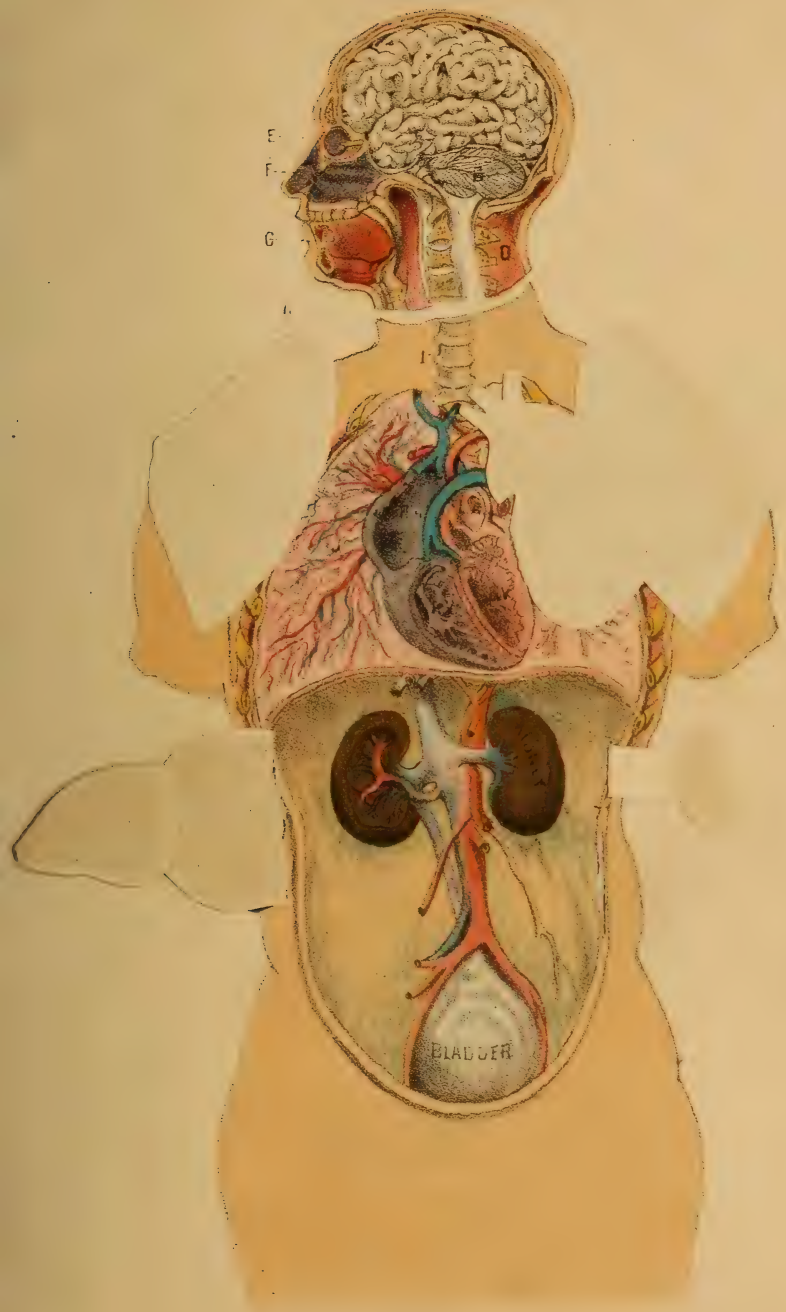
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MAN, THE MASTERPIECE,

OR,

PLAIN TRUTHS PLAINLY TOLD,

ABOUT BOYHOOD,

YOUTH AND

MANHOOD.

BY J. H. KELLOGG, ~~M. D.~~.

MEMBER OF THE BRITISH AND AMERICAN ASSOCIATIONS FOR THE ADVANCEMENT OF SCIENCE, THE AMERICAN PUBLIC HEALTH ASSOCIATION, THE AMERICAN SOCIETY OF MICROSCOPISTS, THE AMERICAN SOCIAL SCIENCE ASSOCIATION, THE MICHIGAN STATE MEDICAL ASSOCIATION, STATE BOARD OF HEALTH OF MICHIGAN, EDITOR OF "GOOD HEALTH," AUTHOR OF "THE HOME HAND-BOOK OF DOMESTIC HYGIENE AND RATIONAL MEDICINE," "LADIES' GUIDE," AND VARIOUS OTHER WORKS.

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1886.

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PREFACE.

THE growing want of the times is for men, for real men, genuine men, men of sincerity, of probity, of moral worth,—old-fashioned men, who are innocent of the arts of social and financial diplomacy, who are unskilled in intrigue and too simple-hearted to comprehend the mysteries of political wire-pulling. Serious people everywhere are earnestly asking, Who of the rising generation are to be the substantial men in the Church and in the State of the future? Who are to be the pillars of society a score of years hence?

That the general tendency of the times is not calculated to encourage the development of the sort of men demanded for the good of the coming generation, is an unpleasant fact too well recognized by observing, reflecting minds to require demonstration here. That such should be the case in the midst of our boasted civilization, in the most enlightened age the world has ever known, is a fact which has become a matter of most earnest solicitude to thousands.

"Weaker and wiser" the world is growing, according to a common proverb, the truth of which is confirmed, in part at least, by common observation. The human race is certainly growing weaker physically. Each generation bequeaths to its successor the accumulated knowledge of preceding ages, so that there must necessarily be a certain growth in intellectual wisdom; but are men growing stronger and better morally?

Whole volumes of saving truth are contained in the ancient maxim which the wise Greeks wrote above the

portals of their temples dedicated to Hygeia, "*Mens sana in corpore sano*" (a sound mind in a sound body). In this volume the author has undertaken to point out some of the evils which lie at the foundation of physical and moral degeneracy, and which, in his opinion, are doing more at the present day to deteriorate the race physically, mentally, and morally, than all others combined. Some of the statements made will undoubtedly startle those who have been lulled into a "Rip Van Winkle sleep" by the alluring delusion of the cry, "Peace, peace;" while the most hideous monsters of vice are waging an unceasing war upon the purity and morals of the race. A few of the facts presented will undoubtedly seem incredible to many whose opportunities for observation have not been such as to give them an adequate knowledge of the extent of the evils with which the author has undertaken to deal; but the greatest care has been taken to avoid the slightest degree of exaggeration, and, indeed, in many instances, one-half the real truth has not been told.

The sole aim of this work has been to inspire the boys and young men of the rising generation with a higher regard for those bodies which the Almighty "created in his own image," and pronounced "very good;" to encourage a greater love and respect for purity in thought and act; to help those whose aspirations are upward, by exposing the snares and evil enticements by which unwary youth are led astray; and thus to aid in the development of a higher, purer, and nobler type of manhood.

The generous welcome which the author's previous works have received from the reading public, leads him to indulge the hope that this effort may be the means of accomplishing some little for the well-being of his fellowmen.

J. H. K.

BATTLE CREEK, MICH.,
Dec. 1, 1885.

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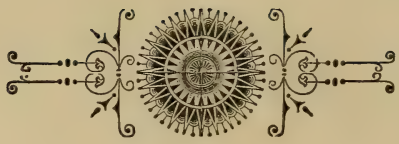

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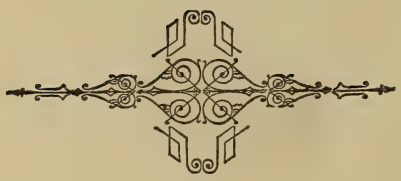


The Masterpiece.

ON the time-stained walls of an antiquated church, in an obscure part of an old Italian city, hangs a canvas, painted by an artist whose ashes have been smoldering in the grave for centuries. Every year thousands of men and women from all Christendom make a pilgrimage to this shrine of art, and, as the monk draws aside the costly covering which protects it, reverentially speak the artist's name, and say, "That was his masterpiece."

The artist who is thus reverenced was but a man, and his work, wonderful as it is, is but the shadow of a human form. The artist himself was a work of art as infinitely superior as eternity is greater than a day. Man, the paragon of creation, is the crowning work of the Divine Artist—the Creator's masterpiece.

A gold watch, with its carved or polished case, is a beautiful object to look upon; but it is only when the case is opened, exposing to view the delicate wheels and levers by which the hours and minutes are accurately measured off, that we begin to appreciate the wonderful ingenuity and skill displayed in this useful mechanism. So it is with the human body. Its beautiful and sym-

metrical exterior excites our admiration; but it is only when we inspect in detail its intricate machinery, its various tissues, organs, and apparatuses, and witness their marvelous processes, that we begin to appreciate the infinite skill and wisdom of the divine Artist who designed and executed this most marvelous of all created works.

Microscopic Wonders.—The human eye, when aided by all the other senses, is not able to discern the infinite delicacy of form and structure which pervades the entire human form; and it is only when that adroit revealer of nature's secrets, the microscope, is brought to bear upon each little thread of tissue in the body, that its infinite grace and beauty of structure and marvelous delicacy of form and composition are discovered.

A philosopher has said, "The proper study of mankind is man." For ages, many of the noblest men have devoted their lives to the study of the "human form divine," bringing to their aid every appliance afforded by the whole range of art and science, and applying themselves with untiring energy and patience to the effort of compelling nature to divulge at least a few of the secrets enshrouded in the mystery of human life. Every fibre of the human body has been subjected to the most searching scrutiny of microscopes so powerful as to make the finest grain of sand equal in apparent size to an enormous rock.

Each structure and organ has been named and carefully described; and to such a degree has knowledge on this point accumulated, it has become the work of a lifetime to become fully acquainted with the minute details of the body and its work. In this brief chapter, we can

only glance at a few of the leading characteristics of the body and the curious processes by which human life and activity are sustained.

The Beginnings of Life.—One warm, sunny afternoon, the writer, having run away from the stern rigors of a Northern winter, was coasting in a little yacht among the mangrove covered isles of Florida Keys. The helmsman had run our little ship into a sheltered bay, where scarcely a breath stirred the glistening waters. While slowly floating with the tide, we seized the opportunity to study life beneath the ocean wave.

One of our two sturdy seamen brings out a water telescope, by the aid of which, leaning over the vessel's side, we are able to look down through the crystal waters twenty, fifty, even a hundred feet, and see with wonderful distinctness the curious and luxuriant vegetable growths and strange and uncouth animal forms which people, in tropical climes, the vast bottom of the briny deep. There are broad fields of branching, somber-colored sea-weeds, with great sea crabs running out and in among them; all sorts of bivalves and univalves, half imbedded in the mud; lovely corals and madrepores, attached to fragments of rocks, or clinging to some marine plant; all kinds of sponges—red, green, yellow, black; queer little star-fish, slowly crawling along over the rocks; and wonderful jelly-fish, floating with the tide.

A Live Sponge.—We thrust down a long pole, with a hook in the end, and seize one of those great yellow sponges. Hauling it up into the boat, we examine the queer, vegetable-like animal. It seems to consist of a horny mesh-work covered with slime. When we get home, if we put a drop of this slime under a microscope,

we shall find it to be alive. This, in fact, is the real sponge, to which the part familiar to us as the sponge, acts simply as a mechanical support, or skeleton. This living slime represents life in one of its lowest forms. Its substance is homogeneous. It really has no structure, yet it feeds, breathes, feels, and possesses, in a primitive form, most of the properties of living things in a higher stage of development.

Men and Sponges.—Strange as it may appear, there is an affinity between the sponge, at the lower end of the scale of life, and man, who stands at the top. If we follow the life history of a human being back to the earliest moment of existence, we find only a little speck of living jelly, substantially like the live portion of a sponge. This living bit of jelly has no nerves, yet it feels; has no lungs, yet it breathes; no stomach, yet it digests; is without hands, yet it works.

The sponge was once a mere little drop of slime, which grew, and gathered in material from the surrounding waters, and from this material it built for itself a skeleton over which to extend, and upon which to live. So the human jelly-drop works and grows and develops and builds cells, fibres, structures, and organs, till at last the human body, with all its wonderful details, is perfected.

Two Hundred Bones.—The body, like the house in which we live, requires a frame-work to give to it firmness and symmetry. This frame-work must be not only firm, but flexible, in order to enable us to use our bodies easily in the great variety of movements required of them. To meet this requirement, the skeleton is

possessed of a large number of separate bones, two hundred in all, which are held together by bands, or ligaments, forming joints. In early infancy the bones are soft and flexible; but in adult life they become hard and rigid. In old age their composition is changed in such a way that they become brittle, and are easily broken.

The bones are not entirely matured until some years after the body ceases to grow in hight, or about the age of twenty to twenty-five. During the years of development, the soft bones may be easily bent out of shape by bad positions in sleeping or sitting, or by improper clothing. It is in this way that curvatures of the spine, flat chests, round shoulders, narrow waists, and deformities of the feet are produced.

Cultivated Deformities.—The most conspicuous examples of deformities produced by artificial means are the feet of fashionable Chinese women, which are converted into queer stumps by the operation of bandaging, which doubles the toes completely under the feet; the head of the flat-head Indian of North America, which is flattened by the compression of a board upon the forehead, or elongated into the shape of a cone by the application of firm bandages; and the wasp-like waist of the fashionable civilized woman, whose perverted ideas of beauty lead her to the vain and foolish attempt to improve the masterpiece of the great Artist by distorting it into a form which, though symmetry in an insect, is deformity in a human being.

This flexibility of the bony frame-work of the body in early life, clearly indicates the importance of training the body to a correct and symmetrical development.

This point will receive particular emphasis in another chapter.

Five Hundred Muscles.—The beefsteak or mutton-chop which you had for breakfast was a portion of the muscle of an ox or sheep. The lean meat of all animals is composed of muscular tissue, which also makes up the great bulk of the fleshy portion of our own bodies. A piece of lean meat that has been salted, after being boiled may be separated into bundles, each one of which may be divided into a large number of delicate threads. If one of these is placed under a microscope, it may be divided into fibres almost too small to be seen with the naked eye.

How a Muscle Works.—Each one of these minute fibres, several hundred of which would be required to cover an inch in space, if laid side by side, possesses the power to contract and then to return again to its natural length. By the combined action of the thousands of these little living threads which constitute each muscle, these organs are enabled to do the work assigned them in the body, which is that of producing motion by contraction.

The total number of muscles in the body is about two hundred and fifty pair, which, with very few exceptions, are arranged symmetrically, each side of the body being provided with muscles exactly like those of the opposite side. Some of the most important muscles are shown in PLATE I.

Uses of Muscles.—By means of the muscles of the legs, acting upon the bones of the legs, we are enabled to walk, run, leap, etc. The muscles of the arms and hands enable us to work, write, play upon musical

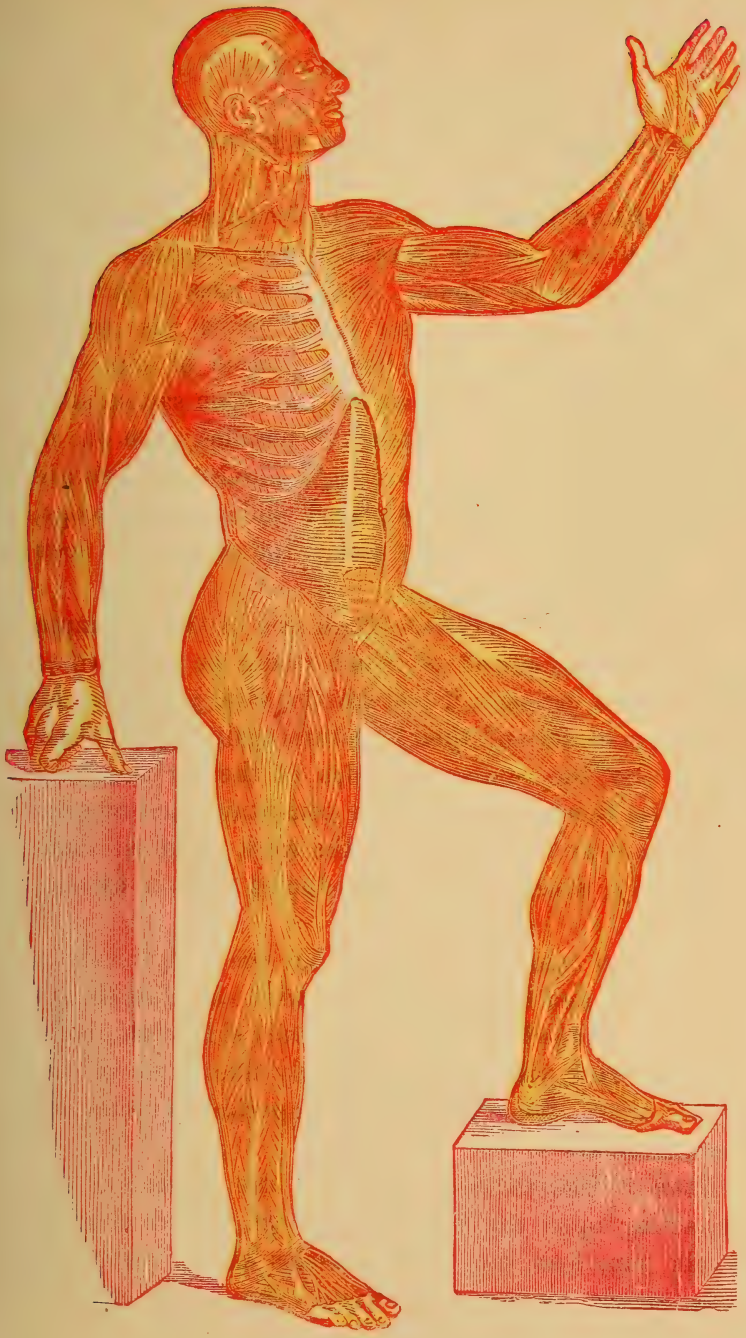


PLATE I.—The Muscles.

instruments, and engage in all sorts of manual pursuits. The muscles of the trunk sustain the body erect, and form the walls of cavities which contain the internal organs. Those of the chest are also useful in breathing, in which they act together with a remarkable muscle within the body called the *midriff*, or *diaphragm*. By delicate little muscles, the eye is moved in various directions. Still more delicate muscles adjust the ear to various sounds. It is by the action of the muscles, also, that the face is able to assume such a vast variety of expressions. Anger, scorn, jealousy, grief, and joy are all pictured upon the face by varying movements of the delicate little muscles which lie just underneath the skin.

Every movement of the body is the result of muscular action. Without muscles, a man would be as helpless as a plant or a tree, which spends its whole life just where its seed happened to take root in the soil. The heart, which by its incessant beating supplies each part of the body with life-giving blood, is simply a muscle, and even the blood-vessels, which convey the blood to the various portions of the body, are scarcely more than muscular tubes. It is by means of muscles, acting upon other organs, that we are able to speak, laugh, and sing, as well as move about.

The muscles also add to the beauty of the body, rounding out the form, covering the ugly protuberances of the bones, and giving to the human form that grace and symmetry which places it so far above all other living forms in point of beauty. How the muscles may be developed, and how they become diseased when not properly exercised, we shall study in a future chapter.

A Live Pump.—Place your hand upon the left side of the chest, just above the lower border of the ribs. You feel something which goes thump, thump, thump. Get a friend to let you place your ear upon his chest at the same spot. You hear something saying lub-tup′, lub-tup′. There is a live pump in there, the *heart*, which keeps working away all your life, from infancy to old age, making sixty to seventy strokes every minute, never stopping to rest even for five seconds, though sometimes it becomes tired and flags a little, and at other times gets excited and runs away at a frightful rate, sometimes so fast one can scarcely count it.

The heart, as we have already learned, is a hollow muscle. A man has more heart than a woman. His heart weighs about ten ounces, while a woman's heart weighs but eight. Roughly estimated, the heart may be said to be as large as the fist. A man with a big fist has a large heart to furnish the brawny arm with an abundance of blood. The heart of a whale is as large as a wash-tub, while that of some small creatures is microscopic in size. (See PLATE II., Fig. 1.)

The Two Hearts.—The heart has a partition through the middle, the longest way, which divides it into halves, each of which is again separated into two chambers. Each side of the heart may be considered as a distinct heart. In some lower animals, as the dugong, the two sides are connected only by a band of tissue. Some insects have three or four hearts. The cavities of the heart are connected with every part of the body by means of a set of tubes, which, at the heart, are as large as the thumb, but by subdivision become so minute in the tissues as to be invisible to the naked eye.

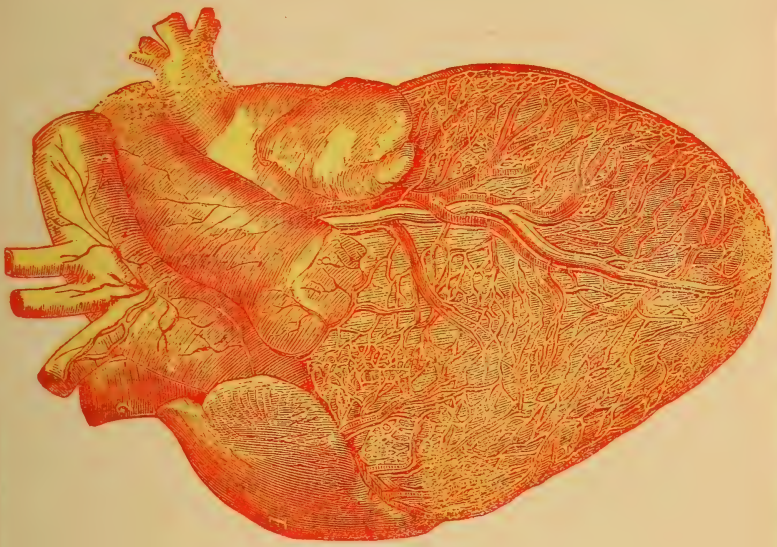


Fig. 1.

Fig. 2.

Fig. 3.

PLATE II.—The Heart and Blood.

Some of these are so small that more than a hundred would be required to equal an ordinary pin in size.

Arteries and Veins.—There are two sets of these tubes, one, called *arteries*, communicating with the lower chambers of the heart, the other, the *veins*, communicating with the upper chambers of the heart. These two sets of tubes run side by side through the various parts of the body, finally joining at the small ends through very small tubes, the *capillaries*. Thus they become, virtually, a single set of tubes, which are large at each end and small in the middle. (PLATE III.)

The lower chambers of the heart pump the blood out into the various parts of the body through the arteries; while the upper chambers receive it back through the veins. The blood which leaves the left side of the heart, returns through the veins to the right side of the heart; while the blood which leaves the right side of the heart, after passing through the lungs, returns to the upper chamber of the left side. By means of openings guarded by valves, the blood is enabled to pass from the upper to the lower chamber on each side of the heart, but cannot pass from one side to the other, except by going the roundabout road of the arteries, capillaries, and veins.

Six Quarts of Blood.—The arteries and veins of a body of average size contain about twelve pounds, or six quarts, of blood. If you wish to know something about this wonderful fluid, you must thrust a pin into the end of your finger, squeeze out a tiny drop, spread it upon a slip of glass, and put it under a microscope. Looking at it through the instrument, you will see that it is no longer red, but of a light amber color, and on

looking closely you will see that it is made up of a clear fluid in which are floating countless numbers of little round bodies, called *blood corpuscles.* (PLATE II., Figs. 2 and 3.)

Some Queer Things in the Blood.—By far the larger number of the blood corpuscles are flat, or disk-shaped bodies, thinner in the middle than at the edge. They are so small that thirty-five hundred of them arranged in a row would extend only an inch. The separate corpuscles are yellow or amber colored; but when crowded together in great numbers, as they are found in the blood, the mass appears red, from which fact they are called *red blood corpuscles.* By looking very sharp, if the microscope is a good one, you will see here and there a corpuscle somewhat larger than the rest, and of a white or grayish color. This is called a *white blood corpuscle.* One of these is found to every three or four hundred of the red.

The blood corpuscles are not inert bodies, which float in the blood current, but are living creatures. Each one leads as independent and individual a life as the fishes that swim in the water, or the birds which fly in the air. The red corpuscles are simply white corpuscles grown old. The life of a corpuscle is supposed to be about six weeks. Several thousand die every second of our lives, their dead bodies being destroyed and removed from the blood by organs appointed for the purpose.

Traveling Tinkers.—Both kinds of corpuscles perform very important offices in the body. The white corpuscles travel from point to point in the body, repairing diseased or injured parts. They are like the traveling tinkers, who go about looking for umbrellas and tin pans to mend. The red blood corpuscles are devoted to the

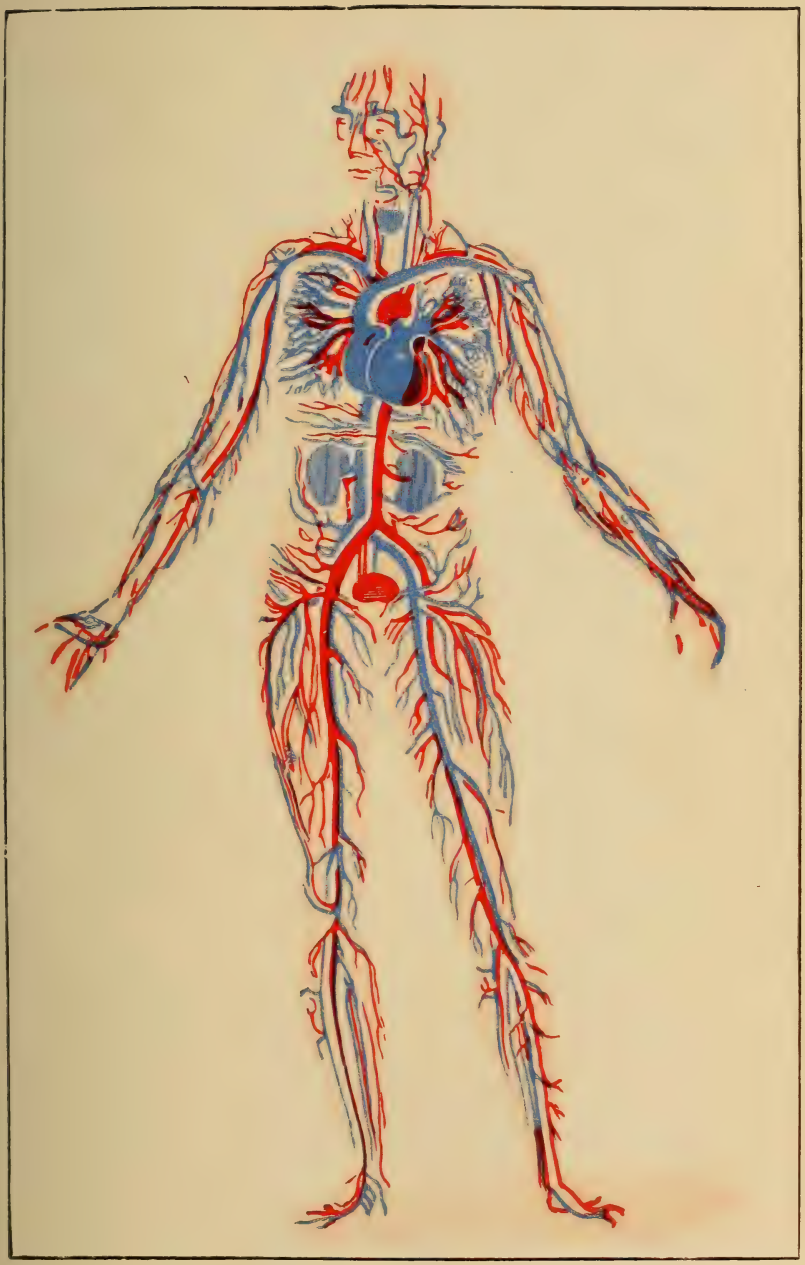


PLATE III.—The Arteries and Veins.

business of carrying oxygen, which they find in the lungs, and transmit to every part of the body. Each corpuscle has the ability to carry a load of oxygen much larger than itself. It is only while the corpuscles are loaded with oxygen that the blood is red. It becomes a dark purple color after the oxygen has been removed It is for this reason that the blood is red in the arteries and dark purple in the veins.

The colorless portion of the blood, called *plasma*, contains the various substances out of which the muscles, bones, and other tissues are formed. These substances are derived from the food which we eat and digest. This portion of the blood also contains various waste substances, which result from the wear and tear of the body, and are being carried to the several organs set apart for the business of removing them, and thus keeping the vital fluid pure.

How the Blood Circulates.—The business of the heart is to circulate the blood, which it does so rapidly that a quantity of blood equal to the whole amount in the body passes through the organ every half minute. The heart of a vigorous man pumps not less than three hundred barrels of blood daily, in doing which it exercises as much energy as would be required to lift one thousand stones weighing one hundred pounds each from the ground to the shoulder.

At each heart beat, a wave of blood starts from the heart, and travels to the most remote ends of the arteries. Where the arteries come near the surface, this wave can be felt, and is called the *pulse*. The pulse rate is usually about seventy beats per minute. It is somewhat more rapid in young children, and is increased by exercise.

The blood starts out from the lower chamber of the left side of the heart, from which it is propelled through the arteries to the various parts of the body. Thence it is gathered up by the veins, and carried to the upper chamber on the right side of the heart. From this it passes to the lower chamber of the same side, whence it is forced through a large artery to the two lungs, through which it passes for purification. It is then carried by veins to the upper chamber of the left side of the heart, whence it passes to the lower chamber of the same side, from which it is again distributed to the various parts of the body. The blood thus makes two circuits before it gets back to its starting point, one from the lower left chamber of the heart to the upper right chamber, another from the lower right chamber to the upper left chamber.

A portion of the blood goes through two sets of veins before getting back to the heart. The blood from the stomach, spleen, and other abdominal organs is gathered up in a large vein, which distributes it through the liver by means of a second set of veins and capillaries. After passing through the liver, which produces some remarkable changes in it, it is carried by another vein to the large vein which gathers blood from the whole lower part of the body, and empties it into the right side of the heart. This is called the *portal circulation*.

How to Take Care of the Heart.—A vigorous heart is essential to a healthy and a long life. A man with a weak heart is as poorly fitted for the voyage of life as a ship would be to cross the Atlantic with a small or inefficient engine.

Every organ in the body depends upon the heart for its supply of blood, without which it cannot do its work.

Without a sufficient supply of blood, the bones deteriorate, the muscles become weak, and every organ suffers.

Proper exercise strengthens the heart. If you count the pulse while lying down, you will find it to be about sixty. On sitting up, the beats increase to sixty-six or eight. On standing up, the pulse rate rises to seventy-four or five. On taking active exercise, as in running or jumping, the pulse may be quickened to one hundred beats per minute or even more. The heart is a muscle, and proper exercise, by thus increasing its activity, may increase its vigor. Exercise, by increasing the activity of the heart, also secures a more rapid distribution of the blood, and thus quickens all the vital processes of the body.

Too violent exercise may injure the heart by overtaxing it, and may even cause rupture of one of the delicate ligaments by which its valves are controlled.

The effects of tobacco, alcohol, and all kinds of stimulants are particularly serious upon the heart, weakening it, at first temporarily and afterward permanently, by causing degeneration of its tissue into fat. A great share of the deaths from so-called heart disease may fairly be charged to alcohol and tobacco.

Bad Blood.—The blood may be poor in quality from containing impurities gathered from the tissues and not removed with sufficient rapidity, or injurious substances which have been taken in along with the food, or from indulgence in stimulants or narcotics. It may be impoverished by having an insufficient supply of the elements required to nourish the tissues. To keep the blood pure and of good quality, one must be careful to keep in good active operation the skin, lungs, liver, kidneys, and

bowels,—channels through which its impurities are removed,—and must carefully avoid taking into the system substances which cannot be used, and which must be removed. Of this class, alcohol, tobacco, and the various stimulating condiments, such as mustard, pepper, pepper-sauce, etc., are among those most commonly used.

An examination of the blood after a sleepless night, or when an insufficiency of food has been taken, shows a very great decrease in the red blood corpuscles, which sufficiently emphasizes the necessity for an abundance of sleep and nutritious food. An eminent New York physician claims to be able to tell by examination of the blood whether a person has slept well the previous night, or whether he has been indulging in excesses of any sort.

If the blood is kept pure and well supplied with the elements necessary to build up the body, the organs of the body will be pretty certain to be maintained in health.

Two Thousand Feet of Lungs.—Did you ever see a frog drink?—Very likely not. Let us go in search of some point where the croakers abound. Here we are, and there is a big fellow sitting on the bank. Now he goes, splash! into the water, and away down out of sight in the mud. Never mind, we will sit down and rest quietly; pretty soon we shall see him coming up to the surface again to get a drink. There he comes now. As he gets almost to the surface of the water, he lets out of his mouth three or four big bubbles of air. He comes slowly to the top, and protrudes above the water the mere tip of his nose, in which we shall see, by looking closely, two little holes scarcely larger than a pin.

PLATE IV.—THE LUNGS.

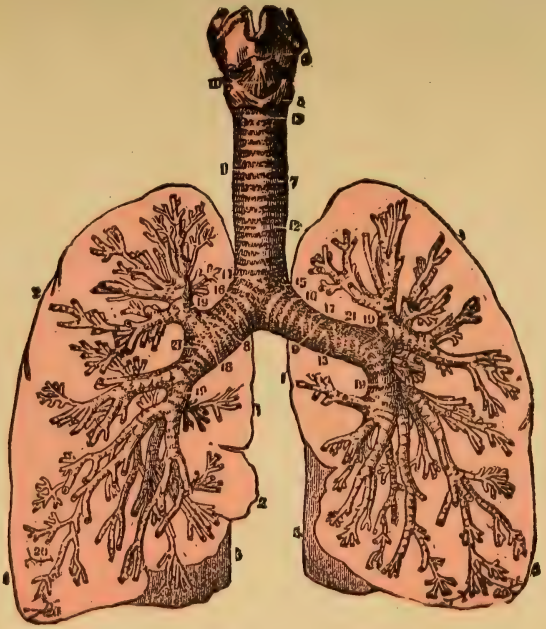


Fig. 1. Bronchial Tubes and Air-Cells.

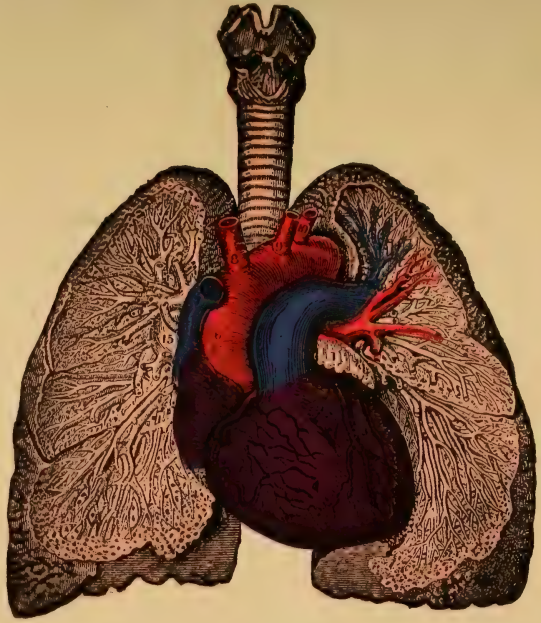


Fig. 2. Heart and Lungs.

Drinking Air.—Now notice his broad throat. We will see that it moves up and down as though he were drinking. In fact, he is drinking, not water, but air. The frog lives in such damp places, he probably never gets dry, and so does not have to drink water, but air he must drink, or he dies.

If some cruel fellow should catch that frog and cut off his hind legs to eat, like a Frenchman, you might dissect his body, and in doing so you would find inside of it two pretty good sized air-bags, connected with the frog's mouth by a little tube. Before the frog goes under water, he swallows air sufficient to fill these bags, then, after being under water a while, he comes up to exchange it for a fresh supply.

Our Lungs.—We have in our bodies air-bags, called lungs, similar to those of the frog, only much more complicated in structure. (PLATE IV., Figs. 1 and 2.) A frog is obliged to swallow air because he has no ribs; but we are enabled, by the arrangement of the ribs forming the chest, to expand the lungs, and thus suck in the air through the mouth or nose. A frog only needs to exchange the air in its lungs once in ten or fifteen minutes, and may under some circumstances go without breathing for a much longer time. But our lungs require that the air which they contain should be changed eighteen or twenty times a minute when we are quiet, and twice as fast when we run or engage in any violent exercise.

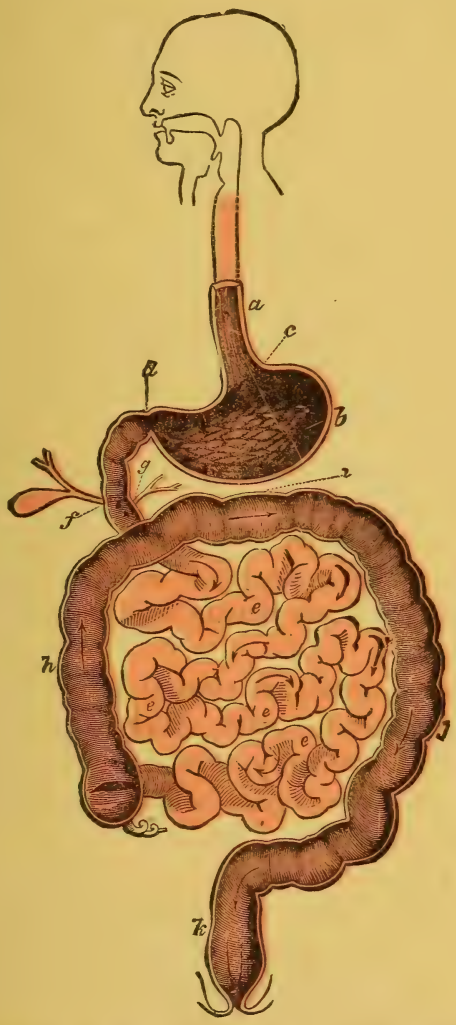
The use of the lungs is to remove certain impurities from the blood. To facilitate this work, they are lined with a delicate membrane which, if spread out, would cover a surface of more than two thousand square feet,

or about eighty square rods. Underneath this membrane, an amount of blood equal to the entire quantity contained in the body, passes every minute for purification, giving off certain poisonous elements, and taking up the life-giving oxygen, which it carries to all the tissues, thus giving them life and activity. We shall learn more about the work of the lungs in a future chapter.

Thirty Feet of Stomach.—A tiny creature that lives in the warm waters of the tropics, has within its body a little sac, which serves the triple purpose of heart, lungs, and stomach. In many of the lower orders of animal life, the heart and stomach are united; but in man the three processes of blood circulation, air-breathing, and food-digestion, are carried on by three distinct organs. As commonly used, the term *stomach* includes all the organs employed in digesting food, of which the stomach proper is only one, and by no means the most important.

The digestive apparatus consists of a very crooked tube some thirty feet in length, which extends from the lips to the other extremity of the trunk. Along this tube are ranged various organs which have more or less to do with the process of digestion.

A Live Mill.—At the upper end of this tube are placed the *teeth*, which, with the jaws, constitute a mill, where the food is ground so as to enable the succeeding organs to act upon it with ease. Some animals, which are not supplied with teeth in their mouths, have very excellent teeth in their stomachs, by which the food is masticated in a most thorough manner. When disposed to eat too fast, we should remember that our stomachs have no teeth; and, hence, if the food is ever chewed at all, it must be done before it is swallowed.



The Digestive Organs. *a.* Œsophagus; *b.* Stomach; *c.* Cardiac Orifice; *d.* Pylorus; *e.* Small Intestine; *f.* Bile Duct; *g.* Pancreatic Duct; *h.* Ascending Colon; *i.* Transverse Colon; *j.* Descending Colon; *k.* Rectum.

PLATE VI.—THE DIGESTIVE ORGANS.

The *tongue* aids in the grinding process, by keeping the food between the teeth, and moving it from one side to the other.

Three pair of glands, arranged on either side of the mouth, pour into it a clear liquid, the *saliva*, which is mixed with the food to soften and otherwise change it. A narrow tube leads from the back of the mouth to the stomach proper, situated just below the lower end of the breast bone.

The *stomach* is simply a dilated portion of the digestive tube, or as it is sometimes called, the *alimentary canal.* It holds about three pints. In its walls are curious little pockets, in which is formed the *gastric juice.* The lower end of the stomach joins the *small intestines*, which are folded up in the abdominal cavity, and measure about twenty-five feet.

A few inches below the stomach, a small opening is found in the small intestines, through which enter two very important liquids, the *pancreatic juice* and the *bile.* The first is formed by the *pancreas*, a hammer-shaped gland which lies just back of the stomach; the latter, by the *liver*, which lies at the right side of the stomach, partially overlapping it.

All along the small intestine are scattered minute little glands buried in the mucous membrane, which make another fluid, called the *intestinal juice.* At the lower right-hand corner of the abdominal cavity, the small intestine widens out into the *colon*, or *large intestine*, which is about five feet in length, and completes the digestive apparatus.

Five Wonderful Fluids.—As we have already noted, there are several fluids concerned in the process of di-

gestion,—the *saliva*, the *gastric juice*, the *bile*, the *pancreatic juice*, and the *intestinal juice*. These are all used to dissolve the food so it can be absorbed by, or taken into, the blood. Each fluid has its particular work to do in transforming some portion of the food into a substance different from what it was, and preparing it to be received into the blood and converted into tissue. Thus, the saliva acts upon the starch of the food, changing it to sugar. The bile digests fat, and aids in the absorption of other portions of the food after it is digested. The pancreatic juice digests starch, albumen, and fats, the three most important elements of food. The intestinal juice digests each of the kinds of food elements mentioned above, and also cane sugar. It is important to notice that cane sugar is digested only by the intestinal juice, which acts, not throughout the whole alimentary canal, but only in the intestinal portion of it.

Digestion of a Mouthful of Bread.—If we could see a morsel of bread undergoing digestion, we should notice, first, that while it is being chewed, the saliva converts a small portion of the starch into sugar. After it is swallowed, the gastric juice begins its work, and digests the albuminous portion of the bread, known as gluten. Just after it passes out of the stomach into the intestine, the liver and gall bladder contract, and pour out a quantity of bile, which searches out any little portion of oil the bread may contain, or the butter which may have been eaten with it, and converts this fatty matter into a creamy substance, which is readily absorbed and distributed throughout the body. The pancreatic juice next finds the digesting morsel, and completes the work begun by the saliva, the gastric juice, and the bile, do-

ing the work of these three fluids much more thoroughly and efficiently than they are capable of doing it themselves. The intestinal juice acts upon any little portion of cane sugar which may have been taken with the food, and gives the finishing touches to the work which has been begun by the preceding digestive fluids.

Thus the mouthful of bread is completely digested. It is next absorbed by millions of hungry little mouths, which are ready to suck up the digested food into the blood-vessels, by which it is carried, first to the liver, and thence to the heart, from which it is distributed to the various parts of the body.

Three and One-Half Pounds of Liver.—Neatly tucked away under the lower ribs of the right side, is one of the most wonderful organs of the whole body, the *liver*. If you should put a little bit of its chocolate-colored tissue under a microscope, you would find it made up of thousands of little round cells, each of which is a busy little worker, devoted to the trade of bile-making. The whole structure of the liver is made up of these cells, together with the vessels which convey blood through it, and the delicate system of sewers which collect the bile, where it is formed by the blood-making cells, and convey it into a large sac placed on its under surface, and called the *gall bladder*. A tube leads from the liver and gall bladder to the small intestine, into which it opens a few inches below the stomach. The weight of the entire organ is about three and one-half pounds, being the largest of all the glands in the body.

The Business of Bile.—The bile is one of the most useful, and certainly the most remarkable of all the

fluids of the body. It is a golden yellow color in human beings and dogs. The bile, or gall, of an ox is green; and in certain diseases persons vomit bile of a green color, which has led to the supposition that human bile is green also. This is not correct, the green color of vomited bile being due to changes which take place in the stomach, where it comes in contact with the gastric juice. The bile has more uses than any other fluid in the body.

1. As we have learned, it aids digestion, helping to change the fats of our food into a creamy substance, called an *emulsion*, which can be easily absorbed.

2. The bile aids in all of the digestive processes which take place in the small intestine, by destroying the activity of the gastric juice, which is strongly acid, and, except for the neutralizing influence of the bile upon it, would prevent the action of the pancreatic and intestinal fluids. Bile also excites the intestines to contraction, by which the digesting food is moved along, and in some mysterious manner helps the mucous membrane to absorb the food after it has been digested.

3. It consists largely of waste substances which have been gathered from various parts of the body. When the liver does not do its work properly, these foul matters accumulate, and the person "feels blue."

Liver Work.—But the liver does something more than make bile. As before stated, most of the blood which passes through the abdominal organs—the stomach, intestines, pancreas, and spleen—is gathered into one large vein, which carries it to the liver, through which it is distributed. The object of this arrangement is to enable the liver to complete the process of digest-

ing such elements of food as have been absorbed before the work was finished, and especially to remove from the blood deleterious substances which have been absorbed with the food.

One of the most important offices of the liver is to gather out of the blood and store up in itself, in the form of a kind of animal starch, the large amount of sugar which is sometimes eaten with our food, and is always formed in the process of digestion when starchy foods are eaten. If these were allowed to enter the general circulation at once, great mischief would be done to many organs of the body; and it is to prevent this that the liver separates the greater portion of it, and doles it out to the blood in small doses, in the intervals between our meals. It is readily apparent that if a person habitually eats more sugar than it is possible for the liver thus to take care of, great harm may be done to the liver, as it would be overtaxed in trying to do its duty to the entire body.

A Self-Sacrificing Organ.— The liver is a most self-sacrificing organ, not hesitating to remove from the blood poisonous substances, even retaining them in itself, instead of allowing them to circulate in the rest of the body. Hence it is that when a person dies in a drunken fit, the liver is found to contain more alcohol than any other part of the body. The same is true of mercury, arsenic, and other metallic poisons, in cases in which death has resulted from their use. Hence, also, follows the great mischief to the liver from the use of mustard, pepper, pepper-sauce, and all hot and irritating condiments. Notwithstanding the generous behavior of the liver, it is blamed for a vast number of human ailments

for which it is not responsible. Take good care of your liver, and it will never tire of taking excellent care of you.

Seventeen Square Feet of Skin.—The anatomists tell us that if the entire skin of the body be removed and spread out, it will cover an area of seventeen and one-half square feet,—considerable more territory than one would be likely to estimate.

Viewed by the unaided eye, this covering of the body is not particularly interesting. Viewed with the microscope, the skin is found to be a very complicated and wonderful structure. Its outer portion is composed of several layers of little flat scales, which overlap one another, and form a sort of horny protection for the more delicate parts beneath. Its lower portion contains the elements which constitute the true skin, and these consist, first, of a net-work of elastic fibres, which give to the skin its great distensibility. As the body develops, the skin is stretched to accommodate itself to the growing form. The outer skin contains—besides this elastic net-work, and dispersed among its meshes—various nerves, which give to it sensibility to touch, and the power of discerning differences in temperature, and, most important of all, great numbers of little tubes, each a small fraction of an inch in length. The lower portion of each of these tubes is coiled up deep down in the skin, while the upper part passes obliquely to the surface. These are sweat glands, of which, taken altogether, there are several million in the body.

The objects of the skin are—

1. *Protection.* It is a good non-conductor of heat, and so protects the sensitive tissues beneath from ordi-

nary changes of temperature, and by its toughness protects them from harm which would otherwise result from contact with objects.

2. *Respiration.* The skin, like the lungs, is a breathing organ. A frog can breathe with its skin so actively that one has been known to live for some days after its lungs had been removed. The human skin is less active as a breathing organ than that of the frog; but its action in this respect is quite too important to be safely ignored. It is through the interference with this breathing process, that neglect of cleanliness of the skin results in harmful effects. To allow the skin to become covered with impurities is just as much a choking process as constriction of the neck or compression of the waist.

3. *Excretion.* The skin is an organ of excretion, carrying away out of the body, through the sweat, a large amount of impurities. This is evidenced by the fact that persons who eat large quantities of salt observe that the perspiration has a very saline taste.

4. *Temperature.* The skin performs a very important office in regulating the bodily temperature. The temperature of the interior of the body is always about one hundred degrees, although the temperature surrounding us may vary from seven degrees below, to three hundred degrees above. It is through the action of the sweat glands and the evaporation of moisture from the skin that the body is enabled to endure the high degrees of temperature to which it may be subjected, for short periods at least, without injury.

5. *Sensibility.* The skin is an organ of sense, giving us information concerning the form and consistence of objects, their temperature and also the degree of press-

ure which they exert. Sensibility to pain also serves as a warning to protect other organs of the body from injury.

The Kidneys.—Imbedded in the tissues of the body, at the back of the abdominal cavity and a little below the stomach, are placed two of the most important organs of the body, the *kidneys*. These important organs, though very unlike the skin in appearance, are in some respects closely related to it.

The kidney is chiefly made up of little round cells, from each of which runs a delicate tube. The tubes run from the outside of the organ inward, joining together to form larger tubes as they approach the center, where they communicate with quite a large cavity, from which a large tube, called the *ureter*, leads to the bladder. The business of the cells and tubes is to separate from the blood a fluid containing the various poisonous substances which constitute the urine.

The *bladder* is a reservoir for the urine, which at proper intervals is discharged through the *urethra*.

Work of the Kidneys.—The kidneys are chiefly serviceable to the body by the removal of the poisonous substance known as *urea*, of which they separate from the blood nearly one ounce every twenty-four hours; and by the regulation of the degree of fluidity of the blood. If we drink a large amount of water, the amount of urine is increased, as the water dilutes the blood beyond its normal condition, and the amount of urine is very largely increased, sometimes within a few minutes after the water has been taken.

The amount of urea contained in the urine depends largely upon the individual's diet, and his habits as

regards exercise, etc. The urine of a person who eats largely of meat, has an excessive quantity of urea, which is due to the fact that a considerable portion of the meat eaten is never used as food, not being assimilated by the tissues, but is at once converted into this poisonous substance, so that it may be removed from the body as quickly as possible.

A white, pink, or brick-dust sediment appearing in the urine is usually evidence of the presence of an excessive quantity of urea, or allied substances, and suggests that the person is eating too much meat, or is not digesting well the albuminous elements of his food. The adoption of a diet of fruits, grains, and milk, and the drinking of hot water an hour before each meal and half an hour before retiring at night, will usually cause this symptom to disappear.

When the urine is very foul smelling or irritating, a physician should be consulted concerning the matter, at least if the difficulty is not made to disappear quite promptly by adopting the use of hot water, as suggested in the preceding paragraph.

Three Pounds of Brains.—The brain of an average man weighs about three pounds. A woman's brain, like her body, weighs a little less. If we examine a little speck of brain substance under the microscope, we find it to be largely composed of curious living cells, some of which look very much like a tad-pole with a long tail; others like a spider with legs projecting on all sides. Each of these little cells, half a thousand of which would be required to make a row an inch long, is a living creature, and has its particular work to do. If we examine with sufficient care, we shall find that the tails, or fin-

gers, possessed by the little creature while in its natural position in the brain, before it has been torn from its surroundings, are immensely long, running to all parts of the body. Some of these fingers are so small that a hundred million of them would be required to make a bundle as thick as your thumb. Thousands of these fibres gathered together form the nerves and the greater portion of the spinal cord, by means of which the brain is connected with all parts of the body.

When we thrust a pin into the end of the finger, it gives us pain because there are some little cells in the brain which send out long, hair-like fibres which end in the skin covering the part where the pin is applied. The cells in the brain recognize the pain, and refer to the finger. These curious little organisms are called *nerve cells.*

Twelve Hundred Million Nerve Cells.—There are supposed to be more than twelve hundred million of these cells in the brain and spinal cord. These wonderful cells control the whole body. All the other organs of the body may be considered as simply servants to the brain. The little cells send out their long fingers to the muscles, glands, lungs, heart, stomach, liver, and all the other organs, and through them send impulses to these various organs, by which they are made to act. Thus, when we wish to move the hand, the cells in the brain which communicate with the muscles of the arm, send down an order to the muscles to contract, and do our bidding. The heart beats, the lungs breathe, the liver makes bile,—all in obedience to the commands received from the nerve cells which preside over it. The nerve cells are divided into classes, each of which has its particular work to do.

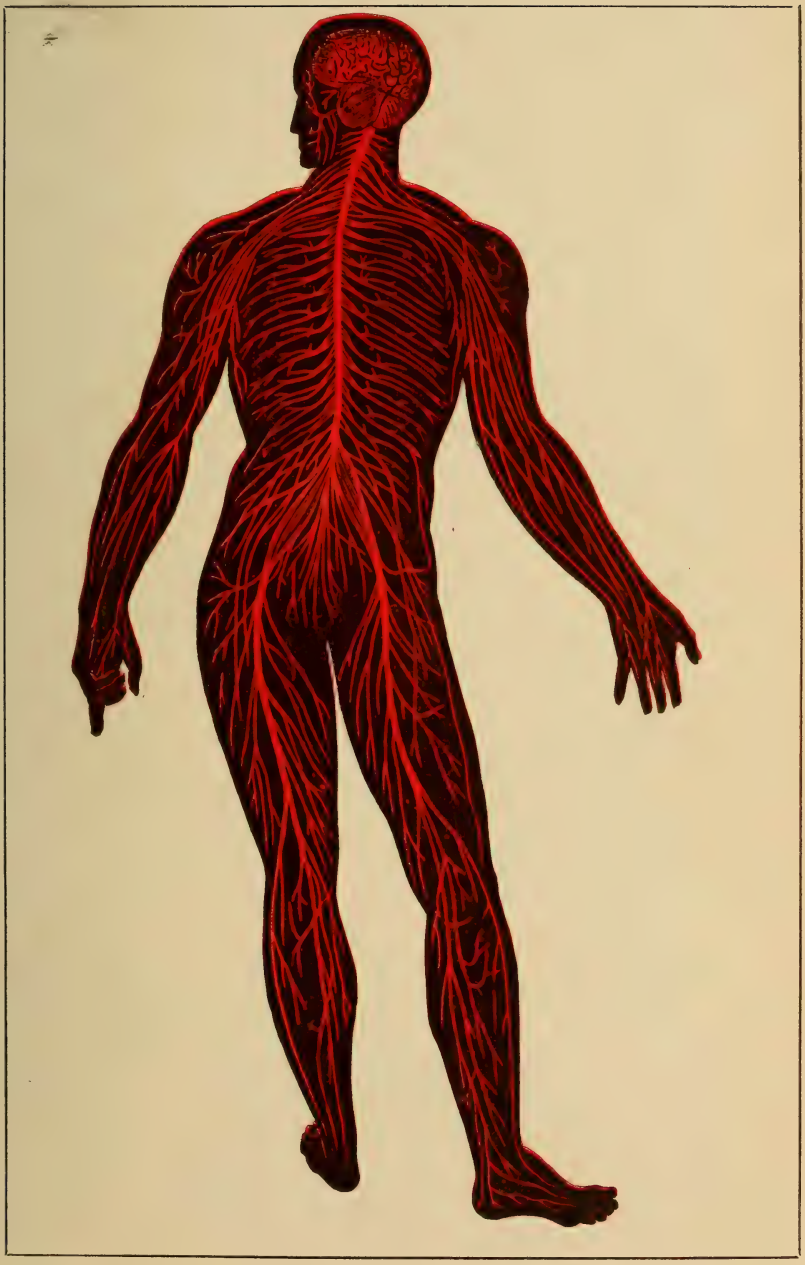


PLATE V.—The Nerves.

Some Queer Thinking.—The chief business of nerve cells is to think and feel. The nerve cells found in the spinal cord are chiefly of two classes. One class receives impressions brought through their fingers from the outside of the body. These impressions they communicate to another class of cells, which, through their fingers, send out impulses to the parts from which the impressions came, or to other parts, causing them to act. For example, when the bottom of the foot is tickled, the limb draws up in spite of us. It does the same thing if we are asleep, or if the limb is paralyzed so that we cannot control it by the will. This is a very simple kind of thinking, which is done by the nerve cells of the spinal cord. There is a special collection of nerve cells in the enlarged upper end of the spinal cord, called the *medulla*, which does a little higher grade of thinking. These cells regulate the activity of the heart, bowels, liver, and other internal organs. At the base of the brain a large collection of nerve matter constitutes what is called the *little brain*, which has for its important function the duty of regulating the action of those nerve cells that control the muscles, so that the muscular movements may be orderly and able to accomplish what is desired of them.

Arranged at the under part of the brain are found nerve centers having charge of the organs by which we are able to see, hear, smell, taste, etc. When we see objects, it is because impressions are received by the eye, and are carried by nerves to the cells at the base of the brain which have charge of the sense of sight, and which are thereby made to act. Whatever causes these cells to act, will give us the impression of light, as

illustrated by the effect of a blow upon the head, or a fall upon the ice, which causes us to see stars, by communicating a shock to the nerve cells that have charge of the sight.

Overtopping all the rest of the nervous system is to be found the *great brain*, which does the highest kind of thinking of which we are capable. It is with this part of the brain that we are enabled to reason. Here is also located the memory and all the various mental and moral faculties. This portion of the nervous system rules all the rest. It is the organ of mind and of will.

Brain and Mind.—The next question, "What is the mind?" we do not need to discuss, more than to observe that it is the result of the action of the brain, the highest kind of thinking done by nerve cells. How brain action results in thought, we cannot understand; but it is also quite as difficult for us to understand how brain action results in muscular action, or in the manifestation of force of any sort. That the brain is the organ of mind, and that mind is the result of its activity, is evidenced by a number of important facts:—

1. When the brain is injured by disease or by accident, the mind is impaired or destroyed, though the rest of the body may remain in comparative health. When the brain ceases to act, as in sound sleep, consciousness and mind action also cease.

2. The amount of intelligence which an animal is able to exhibit, depends upon the size of the thinking portion of the brain in proportion to its body. Man is the most intelligent of all animals simply because he has more cells capable of thinking than any other animal. There are animals which possess a larger brain than

man, but none in which the thinking portion of the brain is so great, in proportion to the size of the body. It is also observed that men whose brains are largest in proportion to their body, other things being equal, possess the greatest intelligence. For example, a man who has a four-pound brain is more likely to be a philosopher, or to be distinguished for great mental powers, than a man whose brain has only the average weight of three pounds; while a man whose brain weighs but two pounds, is certain to be an idiot.

Women have smaller brains than men, the average weight of a female brain being about six ounces less than that of the average man. This fact is often cited by a certain class of philosophers to prove that woman has a weaker mind than man; but the argument is not conclusive. Those who urge it overlook the fact that woman has a smaller body than man. This fact being taken into account, it is found that the average woman's brain is larger in proportion to her size than that of the average man.

Our Eyes.—Nearly all animals possess certain nerves which are sensitive to light. Even the jelly-fish, which has hardly any nerves at all, and certainly has no eyes, seems happiest in the sunlight, and is disturbed whenever a cloud passes over the sun.

Did you ever see a leech,—one of those curious creatures which the doctor sometimes applies to draw away a little blood from an inflamed part? If you should examine one of these strange animals, you would find, close to the little opening which constitutes its mouth, a circular row of minute red spots. These are its eyes. By examining one of these red spots with a

microscope, it is found to consist of a little dark pigment, or coloring matter, over which is spread a thin, transparent skin. Between the colored and the transparent layers is placed a very delicate membrane, which contains the nerves of sight. These nerves pass from the eye-spots back into the creature's little brain, where they unite with certain cells which have charge of the sense of sight.

The leech has the simplest kind of a seeing apparatus. The human eye has essentially the same kind of a structure. The eyeball, as the round globe of the eye is called, has a dark colored lining at its back part and a transparent membrane in front.

Just inside of the delicate lining is stretched out the membrane which contains the nerves of sight. The space between this and the transparent membrane in front is filled up with transparent substances through which the light readily passes. In front, and just behind the transparent portion, is placed a little curtain with a hole in the center, which contracts and enlarges according to the intensity of the light, so as to protect the delicate nerves of sight from injury upon exposure to too bright light.

We have not here the space to study the delicate arrangements by which the eye is made to see objects at a near or a remote distance.

Our Ears.—The little barnacle, which passes its life clinging to the slimy bottom of some old ship, has the simplest kind of an ear imaginable. The organ in this animal is a little sac filled with fluid, which hangs in a chamber communicating with the surface, and filled with sea water. In the walls of this sac, the nerves of

hearing, for which, in its vegetable-like life, it can have very little use, are distributed.

The ear of a fish consists of a small sac, containing two or three chalky masses called ear bones, placed in a chamber adjacent to a sac containing the ear fluid and nerves of hearing. The fish's ear is entirely inclosed in a hollow in the skull. It hears by means of the vibration of the water, which is communicated to the bones of its head, thence to the ear bones, and then from these to the delicate sac from which the nerves of hearing convey the impression to the brain.

The human ear, consisting of the same essential features as that of a fish or a barnacle, is much more complicated in its structure. There is within a hidden recess in the skull a curiously shaped sac filled with fluid, and containing a number of minute ear stones. This sac is connected by means of a chain of bones with a vibrating membrane, which closes the end of the canal connected with the external organ ordinarily known as the *ear*. Sounds are produced by vibrations in the ear. These vibrations are gathered by the external ear, and cause vibration of the membrane, which, from its striking resemblance to that of a drum, is called the *drum membrane*. This vibration is carried by the chain of bones across the cavity in which they are placed, termed the *drum cavity*, to the delicate sac, within which are found the *ear stones* and the nerves of hearing. The little ear stones dance up and down upon the ends of the nerves, and produce sensations which are carried from the ear to the brain. The vibrations produced are known as *sound*. Rules for preserving the health of the ear are given elsewhere in this work.

Noses.—The nose, one of the most conspicuous features of the face, though one of the most neglected organs of the body, is useful as well as ornamental, and worthy of at least a moment's notice. The primary office of the nose is to receive air to supply the lungs. For this purpose it has two openings in the face, which communicate with the large nasal cavity, partially divided into two compartments by the septum of the nose, and which communicate at its back part through a single opening to the mouth, and thence with the air passages leading to the lungs.

On either side of the nasal cavity, three scroll-shaped projections, ranged one above the other, are to be found. The mucous membrane covering the uppermost of these projections, together with that which lines the other portions of the roof of the nasal cavity, contains the nerves of smell, by means of which we are able to distinguish odors. In civilized human beings, this sense is by no means as acute as in the lower animals and in members of savage tribes. This is undoubtedly due to the neglect to cultivate this important sense. It may also be attributed, in part at least, to the very general prevalence of nasal catarrh, which often results in partial or complete destruction of the sense of smell. This disease, its causes and proper treatment, will be referred to in another chapter.

How and What We Taste.—The nerves of taste are located in the tongue and the back part of the mouth. Substances must be dissolved, to be tasted. The tongue, like the skin, is also an organ of touch. Indeed, it is much more sensitive to the touch than the skin. Substances which have an acrid, saline, or astringent flavor,

like mustard, pepper, salt, etc., properly speaking, we do not taste at all, but feel. The sensations which they produce upon the tongue differ in degree, but not in kind, from that which they produce when applied to the skin. Many other substances which have a pronounced odor are smelled rather than tasted, the odorous property to which we attribute flavor being carried to the nose through its posterior opening by the breath, while the substance is being chewed. The only true tastes are sweet and bitter. Most flavors are combinations of taste proper with feeling or smell.

The object of the sense of taste is to tell us whether substances taken into the mouth are wholesome or poisonous. It is a universal rule that substances with an acrid, astringent, or other unpleasant flavor, are unfit for food, and liable to do harm if taken in any quantity. Mustard, pepper, pepper-sauce, ginger, and other similar substances commonly used as condiments, are all of them poisons. A drop of pure concentrated oil of cayenne will produce death almost as suddenly as a drop of Prussic acid. The use of these substances, we find, is possible only when taken in very small quantities, or when the system has been gradually accustomed to their use.

They are all injurious to the digestive organs, as we shall see elsewhere; and, hence, the warning against them which nature gives us in their peculiar flavors, should be recognized and obeyed.

The Mystery of a New Life.

NO subject in the entire range of physiology possesses such a power of fascination over most minds, as this. The physiologist studies the process in plants and animals of all classes, and sees in it the manifestation of a creative power which seems little inferior to that by which the first man and the first of all living things were brought into existence. The uneducated witness the phenomenon of reproduction with less appreciation of its sublime affinities, but with endless wonderment, and an insatiable curiosity to penetrate the cloud in which the "mystery of a new life" is enveloped.

Notwithstanding, the subject of reproduction has in some way become connected, in the minds of the majority of persons, with ideas of vulgarity and grossness. So deeply rooted is this prejudice, it is almost impossible to speak or write upon this subject, no matter how judiciously, without arousing a bitter and almost fanatical opposition, even from some of those who love purity and abhor vice, although in their blindness they place themselves in opposition to an effort to rob sensuality of its greatest ally, the cloak of mystery which custom has thrown about the subject of reproduction.

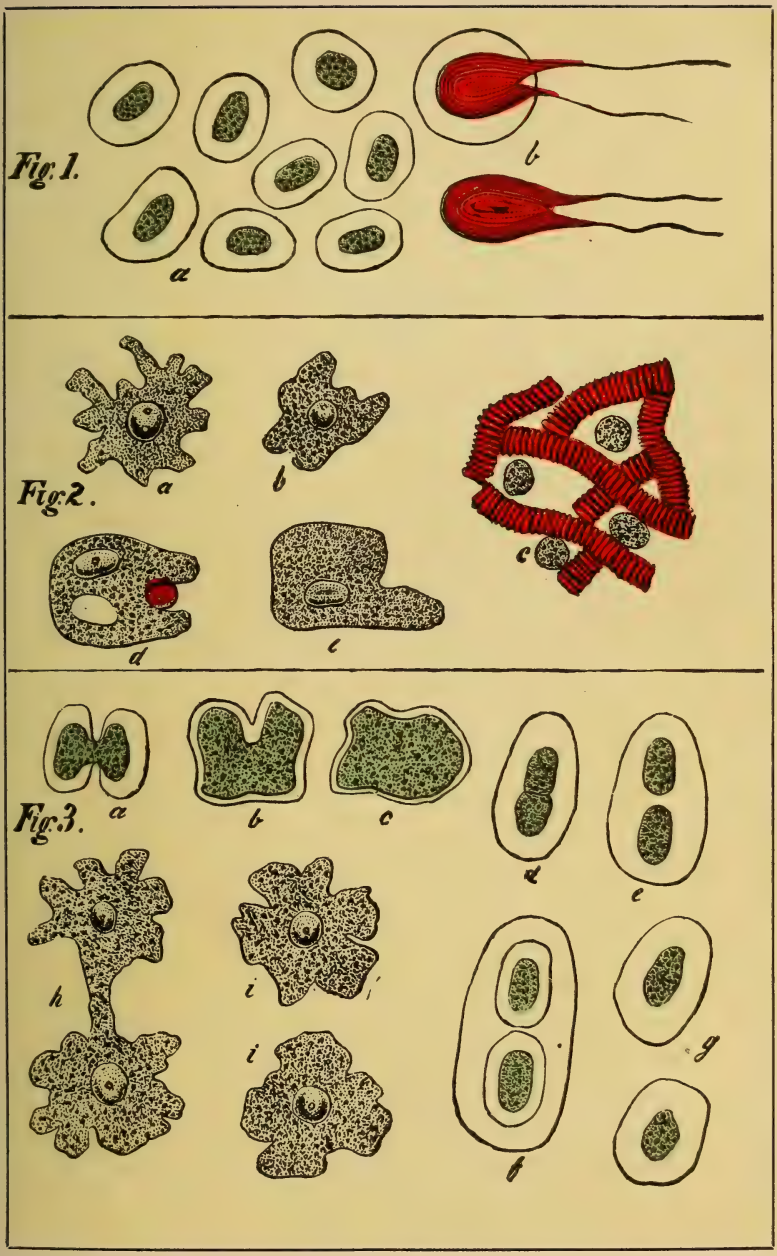


PLATE VII.—Low Forms of Life.

The object of this chapter is to treat this subject, the anatomy and physiology of reproduction, from a purely scientific standpoint, divested of all mystery, and of that sentimental gloss beneath which the prurient literature of fiction has buried it.

Anatomy of the Male Sexual Organs.—The essential organs of reproduction in male animals are the *testes*, or *testicles*, which produce a viscid fluid known as *sperm*, and this, when mixed with other secretions, constitutes the *seminal fluid*. The testicles are, in man and most of the higher animals, suspended outside of the trunk in a membranous pouch, the *scrotum*. In the whale, the elephant, and the seal, the testes are retained within the trunk, where they are also found in man at an early period of fœtal life. Occasionally, the organs fail to make their descent, or return to the abdominal cavity after having descended. (See PLATE A.)

The testes are separated by a partition in the scrotum. Each weighs from three-fourths of an ounce to an ounce, the left often being a little larger than the right. Each testicle is divided into several hundred lobules, in each of which is found coiled up a minute tube. These, joining together, form larger tubes, which, finally uniting, form a large duct, called the *vas deferens*. This tube, together with the arteries and veins of the part, forms the *spermatic cord*, by which the testicle is suspended.

The vas deferens passes upward from the testicle, enters the abdominal cavity through an opening near the groin, and ends at the base of the bladder. Here it meets another duct, coming from a sac, the *vesicula seminalis*, placed at the base of the bladder, in which is formed a peculiar mucous secretion. The two ducts

unite to form a duct called the *common seminal*, or *ejaculatory duct*. The last-named duct passes through a mass of glandular and muscular tissue, called the *prostate gland*, and joins the *urethra*, the urinary passage from the bladder outward. (See PLATE B.)

That portion of the urethra which passes through the prostate gland is known as the *prostatic* portion. Just in front of the prostate is a somewhat contracted portion about one inch in length, known as the *membranous* portion. Just here are found a pair of small bodies known as *Cowper's glands*, which, with the prostate, furnish the greater part of the secretion known as the seminal fluid.

The urethra passes outward through the male organ of *copulation*, the *penis*, which is composed of a peculiar kind of structure known as erectile tissue. The end of the organ, termed the *glans*, is covered by a fold of the skin, called the *prepuce*, or foreskin. This is sometimes too long, and is often so contracted at the end that it cannot be readily drawn back over the glans, which is essential for daily cleansing, owing to the rapid accumulation of a secretion peculiar to this locality.

The Physiology of Reproduction.—If we gather a little of the green scum which may be found upon any stagnant pool, and place a small speck of it under a microscope, we shall find among the many curious forms of plants and animals presented to the eye, a peculiar class of organisms which are arranged in rows and attached together, so as to form filaments. These are very simple forms, each individual being scarcely more than a simple, rounded cell. If we study these curious forms of life for some time, we will occasionally find two of the

Fig. 1.

Fig. 2.

Fig. 3.

PLATE IX.—SEX IN PLANTS.

rows arranged side by side, and may notice that two of the cells—one in each of the rows—lying adjacent to each other, have apparently grown together, as seen in Fig. 1, PLATE IX. By watching very closely indeed, we may observe that the contents of one of the cells seems to be moving toward the other cell.

This is the simplest form of generation. The cells composing one of the filaments are of one kind, which may be termed male; and those of the other are of another kind, which may be termed female. Although the eye, even when aided by the microscope, discovers no apparent difference between them, they are known to be different because they act differently. When the two kinds of cells unite, one cell is gradually merged into the other. The cell which is thus lost is the male cell. The process of combining is known as *fecundation*, *impregnation*, or *fertilization*.

The cell formed by the combination of the male and female cells becomes what botanists call a "resting spore," which after a time undergoes many curious changes, by which new individuals of the same species are produced.

Sex in Flowers.—In higher orders of plants, a very similar process occurs. One flower, or one part of a flower, produces the male element, and another part of the flower produces the female element. (See Figs. 2, 3, PLATE IX.) The male element in the flower is known as *pollen*, which is produced upon the stems, or male parts, and transferred by insects or the wind to the pistil, one of the female parts of the flower. At the bottom of the pistil is found one or more cells, in which is contained the female element, known in the flower as

the *ovule*. The pollen grain, lodging upon the pistil, sends down through its structure a fine, thread-like root, which penetrates the ovule, and thus impregnates, or fertilizes it, as the result of which it develops into the seed, and this, being planted, reproduces the original plant. This is a much higher form of reproduction than that which occurs in the pond scums; but its essential characteristics are identically the same.

Reproduction in Animals.—Although wonderfully unlike in most particulars, animals and plants approach very near together in their mode of reproducing their kind. Reproduction in animals, as in plants, begins with the union of two unlike elements, called respectively male and female. In some of the lowest forms of animal life, as among the most lowly vegetable forms, the beginning of a new life is laid in the union of two individuals, one of which loses its identity in the other. In some instances, a new individual, formed by the union of the male and the female elements, simply grows and divides. The newly formed creatures are again subdivided until many millions may be produced from the first pair.

In the higher animals, as in the higher orders of plants, reproduction becomes a complicated and most highly interesting process. Instead of having a combination of two entire individuals at the beginning of the reproductive process, we have simply the combination of two elements which are produced respectively by male and female organisms, each of which is furnished with a special organ or set of organs, for the purpose of producing its characteristic reproductive element. The reproductive element in animals is known as a spermatozoön. The female element is called the ovum. For illustration

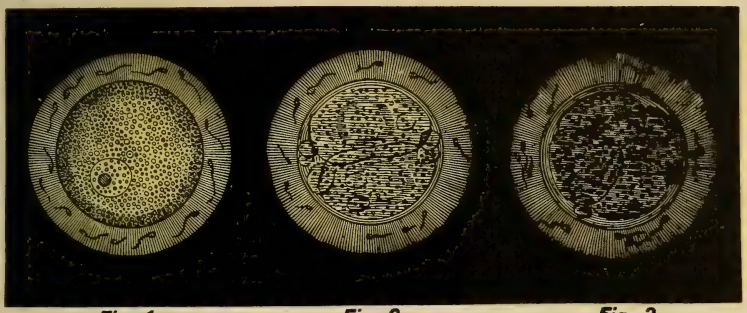


Fig. 1. Fig. 2. Fig. 3.

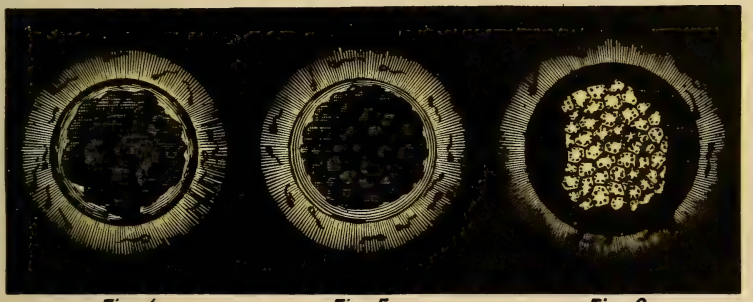


Fig. 4. Fig. 5. Fig. 6.

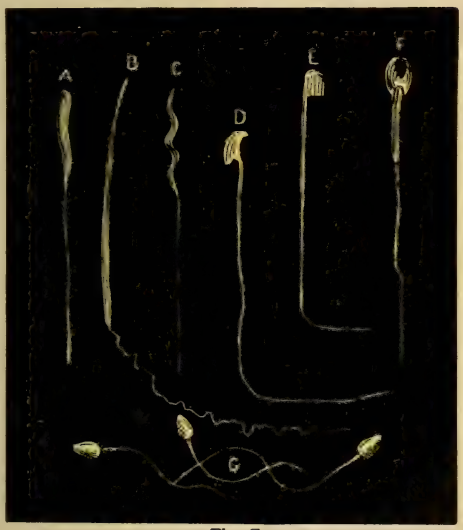


Fig. 7.

Fig. 8.

PLATE VIII.—The Reproductive Elements.

of some of the different forms of these elements found in different species of animals, see Fig. 7, PLATE VIII.

Testes and Ovaries.—The male element, as already explained, is produced by organs known as *testes;* the female element, by organs called *ovaries.* The production of the generative elements is, in some classes of animals, constant, and in others intermittent or periodical. In most species of animals the male element is produced constantly, while the female element is produced, or at least matured, only at regular intervals. In the human female, as in the female of all the higher orders of animals, the ova are matured periodically, usually in human species, once in about four weeks, the cycle being usually marked by the *menses*, or *menstruation.* The ovum is matured at the time of menstruation, but it is not usually discharged until a few days subsequently. In lower animals, the periodical process known as "the rut," corresponds to menstruation in the human species, although it is not accompanied by a sanguineous discharge. The latter has been noticed, however, in some species of the ape tribe which approach most nearly to man in their physical structure.

Fecundation.—The act of impregnation, by which the male and female elements are brought in contact in the higher forms of animal and vegetable life, is accompanied by a greater or less degree of excitement on the part of the individual organisms. Even in plants, during the development and fertilization of their flowers, which are the sexual organs of plants, there is a noticeable increase of activity, a rise of temperature, and an exuberance of perfume, which indicate a high degree of excitement of a peculiar kind. In the higher animals,

the act is accompanied by the highest degree of nervous excitement of which the body is capable, the exhausting character of which is readily seen by the fact that in some instances the act is almost immediately followed by the death of one of the participants,—the male —as in the case of the honey-bee.

Gardeners are also well aware of the fact that plants become sickly, and go into a sort of decline, if compelled to produce flowers too profusely, or for too great a length of time.

Conception.—In impregnation, the ovum is penetrated by the spermatozoa which come in contact with it, and ultimately disappear in its interior. Whether these curious bodies, formerly erroneously supposed to be animalcules, pass directly through the wall of the ovum, or through an opening specially provided for their entrance, is not certainly known, although it is probable that, in some species of animals at least, the ovum is provided with an opening of the kind referred to.

When the ovum has been thus impregnated, conception is said to have taken place. It is not certainly known whether, in the human family, conception occurs in the uterus (or womb), in the Fallopian tubes (the passages which lead from the ovary to the womb), or upon the surface of the ovary, where the ovum is formed. It is possible, however, that conception may occur at either one of these points.

Development.—Wherever the conception may occur, the ovum soon fixes itself upon some point on the inner lining of the womb, and the period of pregnancy begins. This period usually lasts nine calendar months, or ten lunar months, during which the menstrual flow ceases,

though in occasional instances it may continue in a somewhat modified form, usually during the early months of pregnancy.

Human Affinities in Lower Animals.—During the period of pregnancy, the ovum undergoes a most remarkable series of changes, passing through various stages of development, in some of which it resembles in the most wonderful degree various lower forms of animal life. At one period, the developing human being, technically called a *fœtus*, resembles, not very remotely, a partially developed chick from an egg which has been incubated for a few days. At another period, the resemblance of the fœtus to that of a dog of a different age is so great that any but an experienced physiologist might readily be deceived. At one time, the extremities of the fœtus resemble very closely the stunted flippers of a seal or walrus. At a certain period, its body is entirely covered with hair, like its near relative in the animal kingdom, the ape. These facts have been used by the believers in the doctrine of evolution as evidence of the common ancestry of man and lower animals. They only indicate, however, community of design in the whole animal kingdom, rather than unity of origin.

Childbirth.—At the end of the period of gestation or pregnancy, parturition or childbirth occurs, and the young human being begins a more independent life, though still wholly dependent upon the mother for protection and sustenance. In some lower animals, the young are much more independent at birth than infant human beings, being prepared to begin at once the battle of life on their own account; while in other species the young are at birth still more feeble and helpless than the human

infant. In the kangaroo, the fœtus is born when but a few weeks old, but does not become sufficiently developed to be left out of the parental pouch, a sort of nursery bag in which the kangaroo carries its young, until nine or ten months of age.

Plural Pregnancy.—In human species, but one individual is usually born at a time; but plural pregnancies are not uncommon. Twins occur in the proportion of about one to seventy-five or eighty cases of childbirth; triplets occur not more frequently than one in five thousand cases; and plural pregnancies in which the number has reached four or five, have been reported, but are extremely rare.

Control of Sex.—There has been much speculation upon the cause of sex, and methods of controlling it. Many ingenious theories have been propounded, but none have stood the test of thorough scientific investigation. Prof. Carpenter, the distinguished English physiologist, thus sums up the present state of knowledge on this subject:—

"The conditions on which the differentiation of sex immediately depend, are as yet extremely obscure. M. Marc. Thury, who has paid great attention to this subject in cattle, has arrived at the conclusion (which, however, demands much confirmatory evidence for its establishment) that the sex of the progeny of a particular act of sexual intercourse is dependent upon the period of menstruation (in women) or of rut (in animals) at which the impregnation of the ovum takes place. If this occurs at the commencement of the period, the offspring will invariably be a female; if toward the close, male, the cause of the difference being the more advanced

stage of maturation of the ovum in the latter case, owing to its having been for a longer period exposed to the warmth of the body of the mother.

"Ploss attributes the sex of the child to the quantity and quality of the nutriment received by the mother during pregnancy, since, from a review of various countries, and a comparison of the relative numbers of males and females born, he finds that when the food is abundant and plentiful, the proportion of females rises; whilst, under opposite conditions, males are most frequent. In mountainous countries, the number of males also increases relatively.

"Preussen, however, on the other hand, considers that better and more abundant food is required by the mother for the production of males. There is strong statistical evidence that the relative numbers of males and females are in some way influenced by the relative ages of the parents.

"The following table expresses the average results collected by M. Hofacker in Germany. The numbers indicate the proportion of male births to one hundred females, under the several conditions mentioned in the first column:—

Father younger than mother,	90.6.
Father and mother of equal age,	90.0.
Father older by 1 to 6 years,	103.4.
Father older by 6 to 9 years,	124.7.
Father older by 9 to 18 years,	143.7.
Father older by 18 and more,	200.0.

"From this it appears that the more advanced age of the male parent has a very decided influence in occasioning a preponderance in the number of male infants; and

this tallies with the fact that, taking the average of the whole of Europe, over which, as a general rule, the state and customs of society bring about a decided preponderance of age, among married couples, on the side of the husband, the proportion is about 106 males to 100 females."

Ante-Natal Influences.—That the character of the individual, physical, mental, and moral, is strongly influenced by the circumstances and conditions surrounding the mother during pregnancy, is a fact too well attested to be seriously questioned. The ancients seem to have been acquainted with this fact, as is shown by the method adopted by Jacob to get even with his close-fisted father-in-law. The early Greeks carefully regulated by law the conduct, diet, and other habits of life of pregnant women. They were forbidden the use of all stimulating and exciting foods, lest the unborn citizen should be injured thereby.

The disregard of this important fact is undoubtedly a prolific cause of the growing constitutional feebleness, and the multiplying physical, mental, and moral disorders which characterize the race at the present day; and unless checked, will, before the lapse of many centuries, seriously threaten its extermination. We shall not here occupy space to give in detail rules of conduct which should govern parents in respect to this matter, but simply note the following particulars:—

1. As a pithy writer has said, "It is the greatest of human felicities to be well born;" and certainly to be well born is one of the most inalienable of human rights. It is evidently the duty of those who take upon themselves the responsibility of bringing new beings into

the world, to see that their physical, mental, and moral conditions are such as will render it possible and probable that they may be healthfully and happily constituted, and prepared to live a happy and useful life.

2. It is unquestionably the duty of the parents to secure for the mother, during the months of pregnancy, such conditions and surroundings as will not only insure to her physical, mental, and moral health, but will encourage the development in the child of desirable traits of character, and the suppression of undesirable qualities.

That much may be accomplished by careful observance of the above particulars, carrying them out in every detail of life, has been established beyond reasonable doubt by numerous examples. The hap-hazard way in which human beings come into the world, is a disgrace and a stigma upon our boasted civilization. Men who devote years of study to the acquirement of such knowledge as will enable them to improve the breeds of their horses or cattle, and spend thousands in costly experiments for the purpose of perfecting and demonstrating their theories, assume the responsibility of bringing into being children who are to take their places in the world's activities a few years hence, without ever giving a moment's thought to the possible relation of causes and results in the generation of human beings. It never seems to occur to them that the same principles which are known to hold good respecting the breeding of animals, apply with equal force to the breeding of human beings. The following interesting historical case will serve to illustrate one of the laws governing ante-natal influence :—

"A Roman magistrate, little, ugly, and hunchbacked, had by his wife a child exactly resembling the statue of Æsop. Frightened at the sight of this little monster, and fearful of becoming the father of a posterity so deformed, he went to consult Galen, the most distinguished physician of his time, who counseled him to place three statues of love around the conjugal bed, one at the foot, the others, one on each side, in order that the eyes of his young spouse might be constantly feasted on these charming figures. The magistrate followed strictly the advice of the physician, and it is recorded that his wife bore him a child surpassing in beauty all his hopes."

Puberty.—At the age of twelve to fourteen years, marked physiological changes occur in both sexes. Prior to this time, those organs which particularly distinguish the sexes have remained in a condition of imperfect development, and the distinguishing features of the general form of the body have been far less marked than they speedily become after this age. Upon reaching this period, the system seems to take a new start in the process of development, and within a few months those changes take place which transform the little boy into a young man, and the little girl into a young woman.

In the lad, the shoulders broaden, the face changes, evidences of a mustache and beard begin to make their appearance, a thick growth of hair appears in the armpits and upon other parts of the body, and there is a rapid increase in hight and weight. This is a critical period for all boys, during which they should be carefully watched by their parents or guardians, as they

are exposed to new dangers and temptations, and are likely to begin to go astray in ways which may ultimately destroy their happiness and usefulness. Beginning to feel that he is a man, the lad who has previously been ready and willing to consult his parents' wishes and to yield to their counsels, now often begins to think himself competent to mark out his own course of action, and is likely to become headstrong, to break away from the restraints of home, and to disregard the advice and admonitions of his superiors. Boys ought to understand that this disposition, if yielded to, will certainly lead them into danger, and will quite likely result in their ruin. It is in this way that thousands of promising lads have been led to make shipwreck of their lives.

Hygiene of Puberty.—This is a period when the physical health needs especial care. The extra demands made upon the body require an ample supply of wholesome and nourishing food. Abundance of sleep and plenty of exercise in the open air should be secured. Boys at this period should not be kept too steadily engaged in hard work, as it may stunt their growth and weaken their constitutions for life. Constant occupation of some sort is desirable, but it should not be too monotonous. The weak muscles of a young boy will not well endure use in one kind of employment many hours at a time; but by change of work, such a lad may be kept busily employed without injury and with decided advantage. The mind should be occupied by a proper amount of study and wholesome reading; but too much reading, especially the reading of exciting and fictitious literature, should be avoided.

Curiosities of Reproduction.—While in the human species, and in many of the higher animals, but a single ovum is usually impregnated at a time, in some of the lower orders, particularly in fishes, the number of ova impregnated, or spawned, at once is sometimes prodigious. For example, it has been estimated that more than nine million eggs are sometimes spawned by the codfish during a single season.

Nature seems to have been very judicious in the distribution of reproductive powers, since sharks and other carnivorous inhabitants of the sea produce but very few eggs; while the vegetable-eating fishes reproduce prodigiously. Harmless and vegetable-eating animals, such as the rabbit and the guinea-pig, breed much more prolifically than carnivorous animals, like the lion, panther, wolf, etc.

The different modes of impregnation of the ova to be observed in different classes of animals is very interesting. In the lowest orders of animals, contact between the sexes seems to be the exception rather than the rule. The eggs of polyps, corals, and allied classes of animals, are sown broadcast upon the waves, where a certain number of them meet by pure accident with the fertilizing element required for their impregnation.

The female fish, in the spawning season, scatters her eggs among the rocks of some sheltered bay, or along the gravelly bottom of a river. During this season, she is closely followed by the male, who scatters in the same place the sperm, by which the eggs are fertilized.

The cuttle-fish deposits its black eggs in masses, which look very much like bunches of grapes, the eggs being held together by glutinous strings, which serve

also to fasten the masses to the stems of marine plants, rocks, or floating objects.

The egg of the shark is a sort of leathery sac, shaped much like a pillow-case, having attached to each corner a spiral filament, by means of which it becomes entangled among the sea-weeds at the bottom of the sea, and is thus saved from being washed ashore by the waves.

That curious creature, the argonaut, carries its eggs with it, securely lodged in the little nooks and crannies of its shell.

Some of the mollusks arrange their eggs in long, gelatinous ribbons, which they glue to the stems of sea-weeds and the surface of rocks. The common whelk arranges its eggs in little bundles containing several eggs apiece, wrapping each bunch in a tough covering, and joining all together in large bunches, which are often washed ashore by the waves.

Remarkable Reproductive Processes.—Some very remarkable phenomena are observed in the reproductive processes of insects. For example, the seventeen-year locust bores holes in the tender twigs of trees, in which it deposits its eggs, then leaving them to care for themselves. In due time the eggs are hatched, and the young, after going through several "moults," bury themselves in the ground, reappearing only after the lapse of seventeen years, during which time they undergo various transformations.

A peculiar worm carries her thousands of eggs on her back, buried in a mass of mucus. After a time the eggs hatch out, and then there appears the curious spectacle of a mother with a whole population of young ones, numbering many thousands, growing on her back.

Even the star-fish, one of the lowest forms of life, has a care for its eggs and its young. The former it surrounds with its suckers, and carries them about with it; and if they happen to float away, it will carefully gather them up again.

Reproduction without Sexual Union. — In some cases, an enormous multiplication of the species seems to take place, under some circumstances at least, without the union of sexual elements. For instance, a polyp may be divided into many pieces, and each piece will in time develop into an independent and perfect polyp. Indeed, the animal seems to multiply its species, to a certain degree at least, by throwing out buds, which gradually separate from the parent mass, and become independent animals.

Even in lizards, lobsters, and some fishes, this kind of reproductive power seems to be present in a degree. In some species of fish, if the tail happens to be lost by accident, a new one will be grown on. If a lobster or a lizard happens to lose one of its legs in a fight with an enemy, in a few weeks it grows on an entirely new member as good as the old one. Some species of earthworms may be cut in two without destroying the animal. Indeed, each half will become an independent worm, one portion growing on a head; the other, a tail.

Mongrels and Hybrids.—Sexual unions usually take place only between individuals of the same race, or species. The progeny which result from union of individuals of the same species, but of different races, is called a mongrel. All the various crosses between different races or varieties of dogs are mongrels. The mulatto is a mongrel, being a mixture of the white with

the black race. Mongrels are quite readily obtained, and are found to be equally as fertile as their parents.

A hybrid is the result of union between individuals belonging to different species. We have many examples of hybrids among flowers, but unions of this sort among animals are much more rare. It is thought by many naturalists that hybrids never occur in nature, as it is only with difficulty that they can be produced, even by the intelligent aid given by man in securing fertilization.

The mule is a hybrid, resulting from a cross between the horse and the ass. The hare and the rabbit have also been crossed, producing leporides. In South America much attention has been given to crossing the goat and the sheep, producing an animal called a chabin, the peculiar fleece of which is highly prized.

The mule, as is well known, is not fertile, and it is noticed that the chabin soon runs out, or loses its peculiar characteristics, requiring frequent renewal by original crossing.

Monsters.—Sometimes the process of development going on in the fœtus during pregnancy is interrupted or deranged so as to leave some organ deficiently developed, or developed to an excessive degree. By this means, various strange deformities are produced, varying in extent from a simple webbed condition of the fingers or toes, or a deficiency in the upper jaw, known as hare-lip, to cases in which the legs are absent, the feet being joined directly to the body, or those horrible cases in which the head is lacking, or so fearfully transformed as to resemble some lower animal much more than the human form divine. The appearance of these strange

looking creatures has given rise to the popular notion that they are the result of a sexual union with some lower animal. This is, however, entirely incorrect, as nature has placed a safeguard against such an amalgamation by rendering conception between animals of such different species, quite impossible.

Hermaphrodites. — Those unfortunate creatures known as hermaphrodites, are the result of excesses or deficiencies in the development of the sexual organs. They are not really a compound of both sexes, as is generally supposed, but are simply deformed males or females, the deformity sometimes being of such a character as to render it difficult to determine to which sex the individual belongs. It should be mentioned, however, that one or two cases have been recorded in which an individual possessed the characters of a male upon one side, and of a female upon the other. In a single instance an individual has been found to possess, in entire, but rudimentary form, both male and female organs.

An example of an hermaphrodite female is to be found in the mate of a male calf when a cow gives birth to twins, one of which is a male. Such an animal is known as a free-marten.

Among the lower orders of animals there are many species, the individuals of which are natural hermaphrodites in the proper sense of the word, possessing all the characteristics of both sexes. In some instances, the union of both sexes is necessary for impregnation, as is the case with the snail; but in other cases, as in the oyster, self-impregnation occurs.

From Boyhood Up.

THE little boy who stands prattling at his mother's knee, happy in the sunshine of her smiles, and sad only when her loving face shows grief or pain, is innocence personified. Fortunate indeed would it be for the human race if these days of childish innocence and purity might be lengthened out through all the years of boyhood to manhood. But rarely indeed is this the case. Almost at the threshold of life, vice or sin in some form steps in to mar its beauty and destroy its purity. How often has the sorrowing mother, whom death has called to lay away in the cold grave a lovely infant son, found consolation in the thought that death had claimed him while yet his heart was pure and his soul unstained; and, as she thought of that other son whom she had reared to manhood with tender care and prayerful solicitude, only to see her hopes dashed to the ground and her fond anticipations hopelessly wrecked by some emissary of evil who had led her beautiful boy, the child of her heart, down the steep declivity of sin to a living death of shame and ignominy,—how she has mourned that he, too, had not filled an infant's grave; and found comfort for the dead in sorrow for the living!

Nothing is more sad than to see a boy who, from earliest infancy, has been the object of parental care and love, breaking away from the gentle restraints of home, and plunging headlong into sin and vice. To save some few boys, and to help them to grow up to a noble and useful manhood, is the chief object of this book.

Notice that little boy. His rosy face beams with a glorious wealth of untainted blood, and a constitution unimpaired by inherited disease. In his gleeful laugh rings the music of a brave and joyous heart. His bright, beaming eyes tell of a generous love and a trusting confidence. What wonderful promise of a grand and useful manhood is there! Could such a lad come up through youth and early manhood to mature middle age with all his faculties developed, expanded, strengthened with his growth, and matured by experience, what could he not accomplish?

Rarely indeed does a boy come to years of maturity without having lost, through ignorance or vice or bad conditions of life, much of those noble powers and qualities with which nature endowed him, and by means of which he might have served his fellow-men, and made life tenfold more useful than, with wasted powers and weakened energies, it is possible for him to do.

Boys' Rights.—Every boy has a right, first of all, to be well born. Of the few things which may be inherited from parents or ancestors, a good constitution and vigorous health and a well-balanced body may be reckoned as most valuable of all. It is as impossible to make a strong, energetic, healthy man out of a puny, weakly boy baby, as to make a strong ox out of a puny, sickly calf. It is true that in very rare cases unpromis-

ing infants do afterward develop into strong and healthy persons; but in these instances the constitution must have been unusually vigorous to have enabled the person to surmount the obstacles presented by a feeble infancy and childhood, and develop the robust health of later years.

Badly Born.—Thousands of boys are cheated out of the life and vigor and physical stamina to which they are lawfully entitled, by the spendthrift habits, as regards vitality, of their parents. The wealthy man who squanders his property regardless of the future welfare of his children, spending his money recklessly and foolishly, is no more blame-worthy than the man who squanders his capital of strength in the same manner. Many a lad might truthfully rise up in condemnation of his parents, and say, "My father ruined my constitution by bad eating or drinking, by excessive labor in the mad race for fame or riches, and by selfish gratification in the use of alcoholic liquors or tobacco." Or he might say, "My mother robbed me of the health to which I was entitled, by dressing regardless of the requirements of health, by fashionable dissipation of every sort, and by neglect of the bodily culture necessary to develop and maintain good physical health."

As an acute thinker has said, "The greatest of all human felicities is to be well born,"—a blessing which the greater proportion of human beings are not permitted to enjoy.

Being well born, a boy has a right to be well reared, to be carefully nurtured, like the rare and tender plant which the gardener carefully protects from injury from every possible source, and faithfully supplies with all

the conditions needed to develop in the very best possible manner and to the highest degree of perfection its symmetry and beauty. If one-half the amount of attention were given to children, that is bestowed upon raising blooded horses, cows, sheep, or even sporting dogs and pet canaries, there would be a far less number of human beings who might be truthfully labeled, "human failures," numerous examples of which at present may be found in every community.

Parents who take the responsibility of bringing children into the world, should consider that in so doing they assume the grave responsibility of bringing them up in such a way as will make them capable of enjoying life, and making it a success for themselves and for their fellow-men. The rearing of a child comprises much more than simply supplying it with food and clothing and a place in which to live.

Other Natural Rights.—The natural rights of a child demand that it should be supplied with proper food, clothing, and a good home. Proper food and clothing mean, not simply such as happen to be most convenient, or even such as is fashionable or customary, but such as will best serve the wants of its body. Consequently, all parents should give to this matter serious study, that they may be able to form a proper judgment of what is best for their children in these particulars.

Thousands of young constitutions are every year ruined by bad food, before their possessors have reached the end of the first year of life; and thousands upon thousands perish before the fifth year is reached, from the effects of bad feeding and bad clothing combined.

In thousands of homes, in civilized lands, the little

ones lying in cribs or creeping or toddling about the floor, are being slowly poisoned by an atmosphere contaminated with impurities, the result of imperfect ventilation. Millions of human lives are snuffed out before the vital flame has scarcely begun to burn, by these unnecessary and most easily preventable causes. This is a matter certainly worthy of most serious attention on the part of every intelligent parent.

Education.—Every boy is entitled to a good education. By education we mean, not simply "schooling," or a course at a university, but that sort of training and culture which will fit him for usefulness in life. Education, if properly begun, will commence with the first dawn of intelligence. The human infant at birth knows less than the young of most lower animals at the same period of life, and some weeks elapse before any marked intelligence makes its appearance; but when the child first begins to reason, even in the most primitive and simple manner, its education really begins, and from this time forward its mental as well as its bodily activities should be directed in such a manner as to secure to it a symmetrical development of the entire individual, physically, mentally, and morally.

The so-called system of education and the influence to which most boys are subjected for a longer or shorter period while in school, seem to the writer to be exceedingly faulty. The aim appears to be to give the student facts and knowledge, rather than the ability to discover new facts and apply old ones. It usually neglects the body almost wholly, and frequently produces a most one-sided development, which, while it at first enables the person to appear to great advantage, ultimately results in failure, both mentally and physically.

The aim of education should be to prepare the individual to make the most of himself in life. It should be a process which will make the most practical men, the most effective workers for the advancement of all human institutions. Any system which neglects any one of the three departments of human nature, mental, moral, or physical, must be necessarily a failure. Simply educating a boy in the arts and sciences, without developing a love for truth, purity, goodness, justice, and other moral qualities, only prepares him to become the most expert of criminals, and fits him the most successfully to elude discovery and defeat justice. So, also, mental and moral discipline, without proper physical culture, may in many respects qualify men for great usefulness in those departments of human life; but will very likely leave them so lacking in the physical force and stamina required for an active and useful life as to render them dead weights upon society, rather than effective agents for the advancement of its interests.

Proper Aims of Education.—The education should be such as will encourage originality of thought, thoroughness in investigation and research, and thoroughness in everything. Impracticable and dogmatic methods, so generally employed in the education of the young, generally result in dwarfing the most valuable qualities of the mind; and it is only those minds which are possessed of an extraordinary degree of individuality and independence of thought that are able to escape this depraving and deteriorating process.

When a boy first begins to observe and think, encourage his budding mind in the direction in which the natural instincts lead. Bring in his way objects of in-

terest which will attract his attention. When he gets old enough to question concerning the properties of the new objects which he sees, patiently satisfy his curiosity by giving him the information which he desires. If he shows some originality of thought, encourage him in thinking for himself, and lead his mind in such directions as will give his investigative disposition opportunity for a healthy development.

Even oddities and eccentricities are by no means to be always repressed, though excessive oddity should not be encouraged. If there were no odd or eccentric people in the world, there would be little or no progress. The strange departures from the beaten track of custom in thought and manners which sometimes amuse or startle us, often lead to the discovery of new truths or the exposure of old errors, which are fostered and maintained more effectively by our conservative educational systems than would be possible by any other means.

Habits.—Cultivation of correct habits from earliest childhood up, especially during the years preceding the attainment of maturity, is a matter of greatest consequence to every human being. Habits are very easily formed, but are changed only with the greatest difficulty. Habits are created simply by the repetition of the same act. In the beginning, the formation of good habits is often not more difficult than the formation of bad habits. The repetition of good acts renders them so easy that they are performed almost automatically, without a thought and without effort. By repetition, also, bad habits come to be performed with equal ease. No parent can accomplish so much real good for his son in any other way as by aiding him in the early years of life in the formation of thoroughly good habits.

The easy grace and courtesy of manner which enable some men to make friends of every one they meet, and without apparent effort, are almost entirely the result of the early formation of habits of manner which render them agreeable to their fellows. The boorishness and repulsiveness of other men, whose real mental and moral worth may be quite as great, which interfere so greatly with their success and advancement in life, may also be traced, in most instances, to the formation in boyhood of bad habits in relation to personal manners and deportment.

So it is in other particulars. Bad habits that are acquired in boyhood, usually adhere to an individual through his whole lifetime. In early boyhood, while the brain is soft and impressible and easily molded by the influences which may be brought upon it, it is a matter of greatest importance that correct and thorough habits should be formed. Habits relate to physical and mental as well as moral acts, and have an important relation to nearly every act or thought.

It is plainly the duty of parents to aid their children in forming such habits as will be conducive to their happiness and usefulness in after years. A child allowed to grow up with slack, slovenly, and careless habits, will all his lifetime be compelled to contend against obstacles to success which will make failure in every undertaking of life almost certain; while a child whose early education has been such as to enable him to acquire habits of order, promptness, neatness, thoroughness, and faithfulness, possesses such qualities as will insure success in almost every enterprise he engages in. Every child ought to appreciate the aid which may be given by its

parents in the formation of correct habits, and should readily listen to the advice and counsel which the wisdom and experience of a father or a mother may so well give, and which will be of inestimable value to a young and inexperienced lad.

Food, Health, and Morals.—Of physical habits, some of the most important relate to eating. As these habits are formed at a very early age, and have most important relations to health and happiness in later years, they are particularly worthy of attention. A child, even at a tender age, often acquires the habit of eating for the simple purpose of gratifying the palate, and very early acquires those tendencies which, when fully developed, end in a complete enslavery of the individual to appetite, or gluttony. At a very early age, the child should be taught that the appetite is to be controlled, that its palate must not be the sole judge respecting its food, but that reason must wield the controlling influence; that it should eat what is best for it, rather than what it likes best. Of course, it is understood that the food should be palatable, and calculated to satisfy a healthy taste; but children very soon acquire a fondness for highly flavored substances, such as sweetmeats, tidbits of every sort, and stimulating foods; and if the appetite is gratified, it soon demands continual satisfaction, to the exclusion of those simple and less highly flavored substances which constitute the natural food of children, and which satisfy a healthy and unperverted taste. The aim should be to preserve natural simplicity of taste, unexaggerated by morbid excitation of the bodily appetites.

Quite extended opportunities for observation have convinced us that the common custom of supplying

children with liberal quantities of meat, is a practice which tends to the excitement of morbid and unwholesome tendencies, and is very often productive of disease. Nature furnishes, in the easily digestible grains, fruits, and milk, foods which are perfectly adapted to the digestive organs of a child; and if the dietary is restricted to the use of these articles, most of the derangements of the digestive organs to which children are so often subject, could be avoided. The use of spices, pepper, mustard, vinegar, cloves, etc., is wholly uncalled for by a healthy taste, and may operate in the strongest possible manner to create an artificial craving which demands an excess of food, and produces, at an early age, conditions which ultimately result in dyspepsia and various physical disorders of a serious character.

The habit of eating between meals, so common among little boys, cannot be too strongly condemned. Such irregularities are not the result of a healthy appetite, but of a morbid craving, which frequently arises from a disordered stomach, and which requires attention, but not gratification.

American boys undoubtedly suffer far more than those of any other land from the disregard of these facts. The peasant boy of Italy, Germany, France, or even England, is satisfied with the very simplest, and often the most meager fare. The Scotch boy eats his bowl of brose, or oatmeal gruel, with a far keener relish than the American boy finds in the highly seasoned viands, the rich cakes, savory pies, and tempting tidbits which his mother, in her mistaken fondness, prepares for him. The Italian boy finds vastly more satisfaction from his meal of boiled or roasted chestnuts, than the American

boy obtains from the rich and savory dishes so common on American tables.

How often do we hear little boys say, when food is offered them, "I do n't like this," or, "I can't eat that." Such remarks are a pretty sure indication that bad habits in eating are already formed, and that such a child may be benefited by going without food until he obtains a relish for wholesome and simple fare.

Confiding in Parents.—Parents should take pains to get acquainted with their boys. Often have we known of instances in which boys have grown from infancy to manhood without having really become acquainted with their parents, and their parents were equally unacquainted with them. Parents ought to encourage a disposition in their boys to confide in them in early infancy, so that they may become acquainted with their childish griefs and trials, and know their hopes and aspirations, and be prepared to direct their minds in safe and wholesome channels. Such an acquaintance will enable parents to supply those higher wants of their children which are quite as essential to their well-being as proper food, clothing, and shelter. It will aid them in providing suitable food for their higher natures.

Make Home Attractive.—Parents ought to consider it a part of their duty to satisfy the love of the beautiful in their children, as well as to satisfy their hunger. To this end their aim, so far as consistent with their means, should be to render beautiful, by tasteful, even though they may be simple and inexpensive, decorations of the dwelling and its surroundings. Useful and entertaining books should be supplied, as the child advances in

years. The home should be made so attractive and home influences so strong that no influence beyond the domestic circle will be sufficiently powerful to neutralize or destroy it. Thousands of boys are led into the broad way of vice and sin who might have been saved to virtue and usefulness, if the home had been attractive, instead of being dull and uninteresting, or absolutely repulsive, as is too often the case.

Special Dangers to Boys.—Thousands of pitfalls lie along the road which leads from boyhood up to manhood. Fortunate indeed is the lad who keeps so close along the strait and narrow path of right doing as to avoid them all. One of the first of the evil habits into which boys are apt to fall is that of disrespect to parents. It is so easy to disobey the commands of father and mother, when they are not at hand to enforce them, or when the disobedience may not be discovered by them; and by and by, especially if the kind-hearted parent fails to administer a proper rebuke or punishment, the child comes to disregard altogether his obligation to obedience. Such a lad is already advanced far on the road to ruin, and nothing is wanting but opportunity and favorable circumstances to lead him to the commission of almost any sin. Parents cannot do their children any greater wrong than by neglect to exact of them prompt and explicit obedience to their commands.

A wise parent will of course avoid demanding of a child that which is unreasonable, or which may with reason appear to the child to be an act of tyranny or a disregard of its rights. Such a course will destroy the respect of a child, and counteract the effect of any

amount of exhortation or even punishment. Most unhappy is the home in which an unruly child holds the reins. We have seen some such homes, in which fathers, mothers, elder brothers and sisters were all in thorough subjection to the petty whims of an infant tyrant, who had been foolishly indulged and petted in his perverseness until he had come to be an autocrat of the domestic circle.

High-Headedness.—Some years ago, the writer was present at a large religious gathering at which a great sensation was produced by a speaker who arose, and, in most impressive tones, exclaimed, "It is a terrible thing for a man to have his own way." As the words were repeated several times, each time with renewed emphasis, the immense audience fairly trembled at the thought of the dire consequences which may result to the man who gives himself up to doing as he pleases. Terrible indeed is it for a man to have his own way, but tenfold more terrible for a child to have his own way, to follow his inclinations without restraint, to know no law but the demands of his own depraved nature and undisciplined will.

The parent who allows his boy to grow up willful, headstrong, undisciplined, and neglectful of the rights and wishes of others, and his obligations to law, human and divine, should not charge his misfortunes to Providence if such a son brings down his gray hairs with sorrow to the grave.

Reliability and Genuineness.—Another of the pits of evil into which boys are apt to fall, is that of deception. A little boy, in the absence of the parental eye, has been guilty of an act of disobedience. His

mother says, "My son, have you disobeyed my commands?" Shame and fear of punishment tempt him to say, "No;" and the mother's fondness may lead her to neglect to inquire into the matter with sufficient care to discover the untruth. One falsehood prepares the way for another, until by and by the love of truth, honesty, and sincerity is totally destroyed, and the lad grows up sadly lacking in those qualities which fit men for positions of trust and responsibility. Such a boy may sometime appear as a defalcating bank cashier or president, or a swindling "confidence man." Genuineness is a trait of character whose value is priceless; and one of the saddest features of our modern times is the growing scarcity of real genuineness, thorough honesty, of steadfast sincerity and reliability. The boy who hopes to be a noble man, worthy of the respect of his fellow-men, and capable of wielding a wide and lasting influence in the world, must from his earliest boyhood cultivate fidelity, honesty, sincerity, truthfulness, and genuineness.

Profanity.—Close upon the heels of the evils already mentioned, which ruin the character and usefulness of so many boys, comes that most absurd and unaccountable of vices—profanity. Nothing is more shocking than to hear, when walking along the street, most terrible oaths, lisped by lips that are too young to speak distinctly, but already familiar with the vile language of the street. What can we hope of such a boy, but that he will develop in due time into a criminal of the deepest dye, and graduate from the school of vice into some prison or reformatory, at an early age?

Vicious Habits.—One who has an opportunity to

see many of the boys of the present generation, often says to himself, "Whence will come the men to fill the positions of trust and influence twenty years hence?" Vicious tendencies seem to have taken possession of by far the greater share of all the boys we meet. The cigar, the cigarette, and the filthy quid claim them as their votaries at an early age. Often have we seen, in large cities, ragged little urchins, scarcely old enough to walk, picking out of the filth the short stumps of cigars cast away by old devotees of the weed, and enjoying them with apparently as keen a relish as the most experienced smoker. The tobacco-using boy soon learns to drink beer and ale, from which it is an easy step to strong liquors and drunkenness.

Worse Vices.—These bad habits and vices are usually accompanied, if not preceded, by others even more debasing in their effects upon the mind, and more destructive to the body. Practices too vile to be even mentioned in these pages are common enough among boys addicted to the vices named, and often among those whom we least suspect of vicious tendencies of any sort. The company of bad boys,—boys who indulge in obscene and filthy talk, should be shunned as carefully as though they were afflicted with some loathsome and contagious disease. No physical disease is more contagious than habits of mental and physical uncleanliness. Fearful indeed is the extent of such habits among the boys of the present generation, including all classes, even the little toddlers of the nursery, to whom the most horrible practices are taught by vile associates and wicked nurses. Impurity in thought or act is one of the most universal of vices among boys. At the present time,

scarcely a school-boy can be found so young that he has not already been instructed in sensuality.

One of the most evident duties of parents to their boys is to instruct them regarding the wickedness and the dangers of vice, and to carefully guard them from the contamination of evil associates.

A boy whose instincts are pure, will flee from the first suggestion of obscenity or vileness, and will avoid those known to be abandoned to sin as carefully as he would avoid a loathsome disease or a poisonous reptile. Happy indeed is the lad who grows to manhood unscathed by the scorching flames of sensual vice, and with a mind unstained by filthy imaginings and mental impurity.

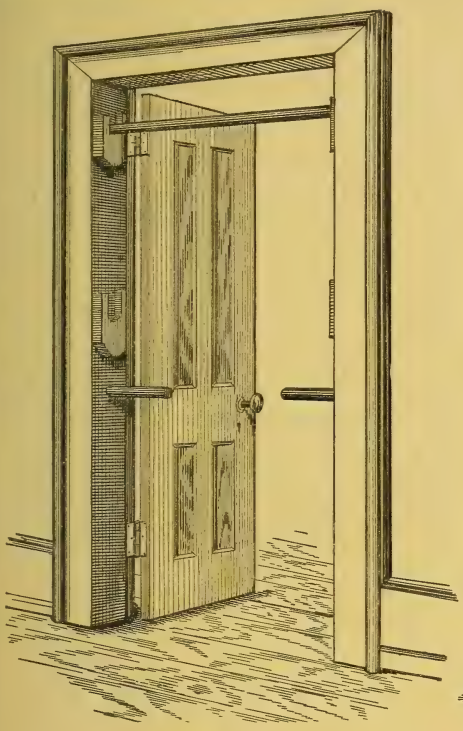


Fig. 1.

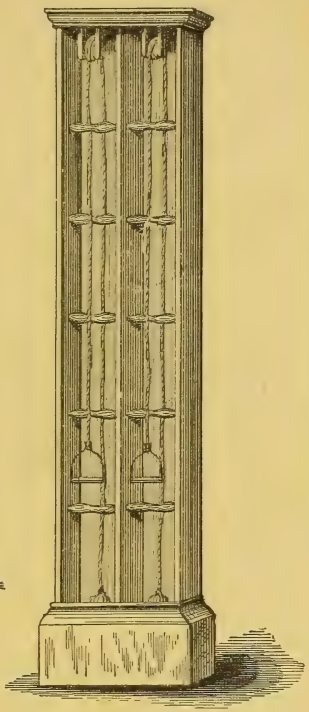


Fig. 2.

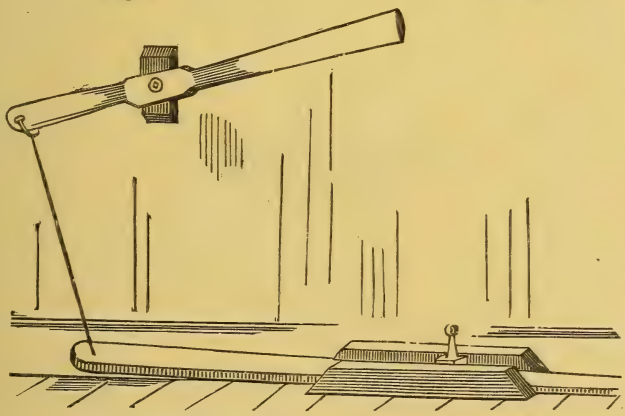


Fig. 3.

PLATE X.—Home Gymnasium Apparatus.

How to Be Strong.

AMONG the ancient Greeks and Romans, strength and symmetry of body were held in highest esteem. Not infrequently, men were chosen to fill the highest positions of authority and influence, when the chief qualification which they possessed was unusual physical proportions and bodily strength. A Roman emperor, while on one of his expeditions, discovered a gigantic barbarian, whom he made one of his generals, and who afterward became himself ruler of the empire. It was natural that the ancients should esteem physical strength so highly, as in warfare the failure or success of an army depended upon the ability and endurance of its soldiers in personal combat. The invention of the fire-arms and artillery of modern times has entirely changed the mode of warfare, so that at the present time the size of a commander's guns and the length of his purse is of even greater consequence than the number of his soldiers.

Decline of Physical Culture.—So, also, the application of machinery to agriculture and to almost all the arts, has greatly diminished the necessity for physical exercise in nearly every branch of human industry, and to such a degree that there is comparatively little de-

mand for mere brute force, and physical development has come to be considered a matter of little consequence. The decline of physical culture has undoubtedly had much to do with the loss of that symmetry of form which obtained its perfection among the ancient Greeks, as shown in the Apollo, the Venus of Milo and other specimens of ancient Greek art.

The modern sculptor who wishes to produce even an approximation to the standard of excellence presented in the ancient models, finds himself quite unable to secure a living model suitable for his purpose, but must make a composite figure by combining the parts of a large number of different subjects, drawing a leg of one, an arm of another, a neck of another, etc.

This degenerative process is rapidly developing a race of deformed and decrepit human beings, who are so different from their ancestors of two or three thousand years ago that they might almost pass for a different species. Each generation seems a little weaker, physically, than the one that preceded it; and the puny, pale-faced boys of to-day, with lank, feeble bodies, active but unbalanced brains, irritable nerves, and precocious propensities, make a poor outlook for the generation to come.

Strong Muscles Win.—Notwithstanding the great and essential difference between the conditions of modern life as compared with the life of the Greek or Roman citizen of two thousand years ago, it is still true that the man of physical strength and soundness is the one who, other conditions being equal, wins the prizes in almost every department of human life. Notwithstanding the many apparent exceptions to this rule,

such well-known examples as those of the English premier, Gladstone, M. Thiers, Victor Hugo, William Cullen Bryant, and others equally notable whom we might name, are sufficient to establish the principle.

Physical development is only to be obtained as the result of exercise. Throughout the whole animal world, exercise seems to be essential to growth and development. It is a universal rule in nature that an organ which is not used, gradually wastes away until it becomes useless, and sometimes disappears altogether; while an organ that is used, develops in proportion to the amount of work required of it. Even the storm-beaten oak gains firmness and strength and increased vigor by the shakings it receives from the tempests and tornadoes which howl through its branches. Each time its massive trunk is swayed, its rootlets strike deeper down into the earth, thus not only securing a firmer hold, but providing an increased number of mouthlets through which nutriment may be received from the soil.

Effects of Exercise and Inaction.—The blacksmith with his right arm swings a heavy hammer, while with his left he holds with a pair of tongs a heated iron, which he beats upon the anvil. In the course of a day, many thousands of vigorous blows are struck. This enormous amount of work performed by the right arm causes its muscles to grow much larger than those of the left, which are little if at all larger than those of men engaged in ordinary occupations.

Notice, on the other hand, the effect of inaction upon the arm of the Hindoo devotee, which he supports in a horizontal position, and consecrates to his deity, keeping it absolutely motionless for years. In consequence of

this inaction, it gradually shrivels up until it becomes a mere stick, simply bone covered with skin, the muscles having entirely wasted away.

We depend upon continued daily exercise for the ease with which we move about. If the hand is hung up in a sling for a few days, the whole arm speedily becomes almost useless. On removal of the sling, even after so short a time as one week, the elbow will be found to be stiff, and the muscles stiff and rigid, and any attempt to move the arm painful. We frequently find the muscles of the body in the same condition as that of such an arm when we undertake to make some unusual movement, such as bending backward or sidewise. We discover that the muscles newly called into action are surprisingly weak, and that their use, even for a short time, may be followed by soreness and discomfort for many days. When little or no exercise is taken, the whole body speedily falls into the same condition of feebleness and uselessness.

A person who for any reason is confined to his bed for a number of days, quickly discovers this when he first stands upon his feet, or undertakes to engage in the ordinary exercises to which he has been accustomed. He finds immediately, on assuming a perpendicular position, a strange weakness in his legs, perhaps a slight light-headedness due to a sudden flow of blood to the lower portions of the body, leaving an insufficient supply in the brain. Perhaps the limbs will tingle with the increased quantity of blood sent into them, while palpitation may lead the patient to fear that he is suffering with some grave trouble of the heart, which has been heretofore undiscovered. If such a person returns to

bed, as is not infrequently the case, and waits for strength to come to him, he will grow weaker and weaker continually, until he may become permanently helpless. We have frequently had such cases brought to us for treatment, sometimes on beds, from long distances. In some instances the individuals had been confined to their beds for eight or ten years, during which time they had scarcely taken a single step. Careful investigation of each case showed it to be one in which the chief fault was weakness of the muscular system, the result of disuse. By a properly graduated course of exercises, the muscular power was gradually recovered, and the patient was restored to usefulness.

It is in cases of this sort that the so-called "magnetic healers," "mind healers," etc., so frequently obtain brilliant results. Recognizing a case to be of the sort described, they profess to perform some curative act for the benefit of the patient, thereby inspiring his confidence, and arousing his hope and expectancy to the highest degree, and succeed in getting him upon his feet; and, each time gaining a little strength, the muscles are soon restored so as to enable the operator to pronounce the patient cured.

Benefits to be Derived from Exercise.—Exercise is beneficial in a variety of ways.

1. As we have already seen, it develops the muscles. The muscles, as we have elsewhere learned, are composed of very minute fibres, each of which has the power to contract. In a muscle which is not used, these fibres become thin and pale, and lose, to a large degree, their power of contracting. In a well-developed muscle, they are large and ruddy, and possessed of a high degree of

elasticity and energy. When a thin, feeble muscle is thrown into action by contraction, it soon loses its pale color, and acquires a deep red color, through the increased quantity of blood which flows through it during its activity. The supply of fresh blood brings with it new nourishment, from which the fibres may replenish themselves. If the exercise is repeated sufficiently often to bring to the muscle an adequate amount of nourishment, the growth may continue until a very unusual degree of development has been attained.

The famous Dr. Winship, by persistent, systematic exercise, succeeded in developing his muscles to such a degree that he became able to lift, by the aid of shoulder straps, fully three thousand pounds,—a load which the stoutest cart-horse could scarcely stand up under. In his youth, Dr. Winship was so inferior in physical development that, when a student at school, he was obliged to bear patiently most provoking insults from his school-mates, because unable to make a good physical defense. He himself said that it was this fact which gave to him the impulse to undertake the course of physical culture which resulted in his extraordinary development.

2. A good set of muscles is one of the most excellent qualifications which a young man can possess. There is no position in life for which they unfit him, and there is none which they will not enable him to fill to better advantage than he otherwise could do. There are a thousand and one emergencies in life in which strong, vigorous, and well-trained muscles are of enormous service, and in which their use may be of incalculable value. Proper physical culture gives, not only increased

PLATE XI.

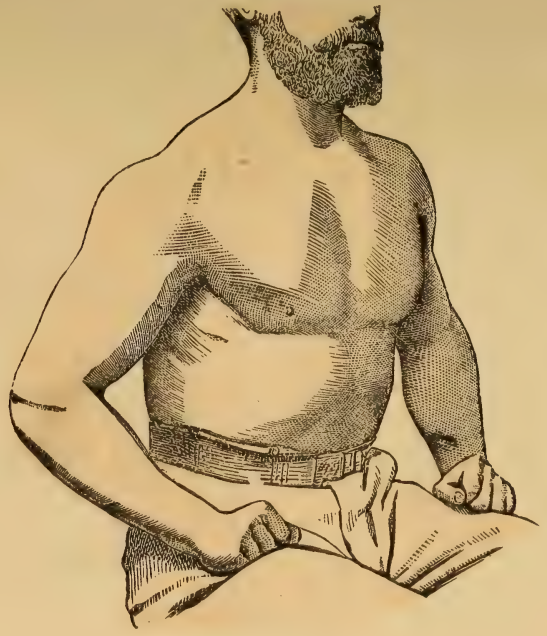


Fig. 1.

Fig. 2.

physical strength, but greater dexterity, suppleness, and grace of movement. The man who walks with a shuffling, swaying, and awkward gait, does so, not on account of any original defect in his physical make-up, but through the weakness of certain muscles which, by disuse, have become unable to do their part in the act of walking, and so render him unable to perform it in an easy and graceful manner. The trained gymnast exhibits a lightness and elasticity of movement impossible to an individual who has not had the benefit of physical training.

3. Proper training of the muscles also prevents or corrects various bodily deformities, such as round shoulders, flat and narrow chests, and crooked backs, and gives to the body an erect and graceful carriage. Many of these deformities are directly or indirectly productive of interference of the body in general through interference with the proper working of the various vital organs, particularly the lungs; and hence physical culture does more than simply add to the comeliness of the body and grace of movement; it really increases the vital capability of the body, and hence lengthens life, as well as rendering it more joyous.

4. Muscular exercise not only improves the health and strengthens the muscles, but directly and indirectly effects in a favorable manner nearly every organ of the body. The muscles aid in supporting the various bones which compose the skeleton, in their proper positions. When the muscles become weak, they relax, and allow various portions of the body to drop into uncouth and unhealthful positions. It is thus that the shoulders become rounded, being allowed to drop forward through

weakness of the muscles which are intended to hold them back in position. The ribs, which form the framework of the chest, not being properly pulled forward and outward through contraction of the muscles attached to them, gradually fall inward, thus flattening the chest, and compressing those important breathing organs, the lungs. By proper exercise, these physical defects may be prevented, and entirely remedied in most persons who have not yet attained middle age. Even in advanced years, much may be done to correct these physical deformities, by properly directed and systematic efforts.

5. Still more remarkable is the effect of exercise upon the activities of various internal organs. The effect of muscular exercise in increasing the action of the heart and lungs is well known. A brisk run will often double the activity of the heart, and much more than double the activity of the lungs. Although the number of respirations per minute may be only double in number, the depth of inspiration, the amount of air taken in at each breath, is also greatly increased, so that the total amount of work done by the lungs is very much more than doubled. This increased activity of the lungs produces a wonderfully beneficial effect upon the whole body.

The heart is a pump which distributes to the tissues the vital fluid by which it is to be replenished. When the heart works more rapidly and vigorously, a larger amount of blood is furnished to every organ in the body, and the tissues are consequently more liberally supplied with nutriment, and more thoroughly renovated.

Not only is a larger amount of new material carried to the tissues, but the old worn-out waste particles are

PLATE XII.

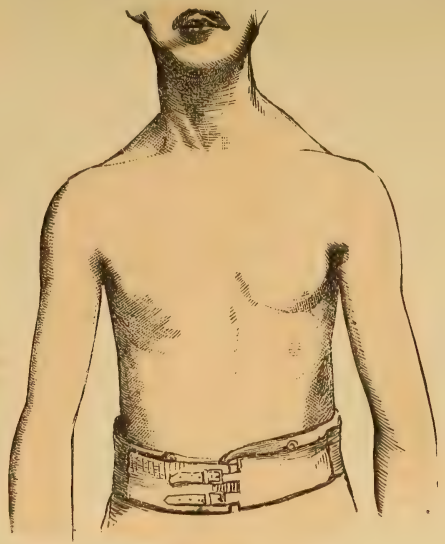


Fig. 1. Undeveloped Muscles.

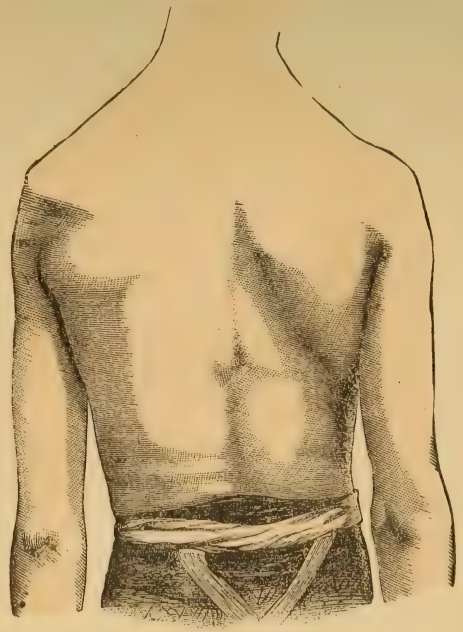


Fig. 2. Sloping Shoulders.

removed much more thoroughly, being carried to the organs whose business it is to remove them from the body as they are eliminated, or thrown off. Thus the body is kept freer from the waste or effete matter which results from the wear and tear of the system.

The lungs, by their increased activity, introduce into the blood and veins of the whole system a larger quantity of oxygen, the great purifier, which vivifies the blood, vitalizes the tissues, and cleanses every nook and corner of the vital domain. Every activity is quickened. The whole system is infused with a higher grade of vitality. The bodily machinery runs at a higher speed, and with greater effectiveness for work. The brain, freer from the products of waste, and supplied with more highly vitalized blood, is able to do better thinking. The liver, having a larger amount of oxygen and a better blood supply, can do more bile-making. The stomach, having its activities quickened by a larger and richer blood supply, secretes a better quality of gastric juice, and more of it, and hence is able to digest a larger quantity of food, and to more perfectly elaborate it and prepare it for entrance into the blood. The demand for a larger quantity of food creates a better appetite and a keener relish for food. Thus, every part of the body seems to take on new life and activity; and, to a person who has previously been in a state of inaction, with his system torpid and clogged by the products of wastes which have not been properly eliminated, the change is almost equivalent to a new birth. After having once tasted of the delights of living on a higher plane, with all his sensibilities quickened, and his ability for enjoyment and appreciation of the pleasures and blessings of

life so greatly increased, one could hardly be induced at any price to return to the old sluggish and inane existence.

6. In these days of hurry and bustle, when a moment gained or lost may mean the loss or gain of a fortune, or even of a human life, the possession of a good "wind," which will support brief, or, if necessary, prolonged active muscular exercise, as in hurrying to catch a train, running to a fire, or to rescue a person in danger, is a matter of inestimable value. Two things are essential for a good wind: (*a.*) A sound and vigorous heart; (*b.*) Large and strong lungs. If either of these organs is deficient, a person, on trying to take a little more active exercise than usual, will speedily find himself "short of breath." The heart is a muscle, and the lungs are filled and emptied by means of muscles, which act upon the chest in such a way as to use it like a pair of bellows, alternately compressing and expanding its walls so as to make the air pass out and in. Muscular exercise causes the heart to beat faster, and by this means strengthens it, just as the other muscles of the body are strengthened. By special exercise, the muscles which operate the chest may be strengthened, and the chest itself may be enlarged so that it will receive an increased quantity of air, and will have greater freedom of movement in the act of breathing.

A Good Wind.—Soundness of wind is one of the essential qualifications for a good walker or a good horseman; and it is for the purpose of securing this reliability of the heart and lungs that the long course of training to which persons who are preparing themselves for pedestrian or rowing contests, are subjected, is entered upon.

Time is required to enable the heart to grow large and strong enough to do the necessary amount of work required of it during the contest, and to allow the lungs to expand to such a capacity as to supply the greatly increased quantity of oxygen required.

Danger from a Weak Heart.—Every now and then we read in the newspapers of a man who has dropped dead in hurrying to catch a train. Such an occurrence is the result of a weakness of the heart, arising from the want of proper training to enable it to support the activity of the other muscles of the body. The heart ought to be able to do its work as well as the other muscles, and should be capable of doing it well, even when the other portions of the muscular system are excited to the highest degree of activity.

A person who is not accustomed to exercise, finds almost immediately, on attempting to take a little exercise, that the blood rushes to his head. He is seized with a violent beating of the heart, and feels as though he was in eminent danger of death. All these inconveniences, however, speedily disappear under systematic exercise, gradually increasing its vigor as the heart and blood-vessels acquire greater tone, so that they are not so readily disturbed by muscular efforts.

How to Test the Heart.—If you feel the pulse of a person not accustomed to exercise, while he is sitting quietly, and then ask him to run quickly up and down the stairs two or three times, and count his pulse again, it will be found to have increased in frequency anywhere from thirty to fifty beats per minute; while the pulse of a person accustomed to vigorous exercise,

counted after the same amount of exercise, may not have increased more than ten to fifteen beats per minute.

By these simple means, any one may test his heart-strength, and while taking a course of muscular training, may discover the gradual increase in heart tone, as indicated by the lessened effect of exercise in increasing the pulse rate.

Probably more than half the business men of the country who have reached middle age, could not run rapidly for a mile without incurring considerable risk, and certainly not without feeling afterward badly used up. Every man ought to be able to run two or three miles at the rate of eight miles an hour, without suffering any serious inconvenience.

7. Physical exercise gives better command of the whole body; and when properly conducted, trains both sides of the body alike, and so almost doubles the efficiency of the muscles. A man who has been trained in the ordinary way, really uses his left side but very little. Everything requiring skill, strength, or dexterity must be done with the right hand. Even the right limb usually has enough more training to make it a little larger than the left. The extra amount of work done by the right side of the body results in increasing the strength of the muscles of this side, and in deformity of the spine, which is made to curve toward the left side, causing the right shoulder to drop a little. There is probably not more than one person in four who does not have this deformity.

With proper physical training, both sides of the body will be equally developed, and should be equally

PLATE XIII.

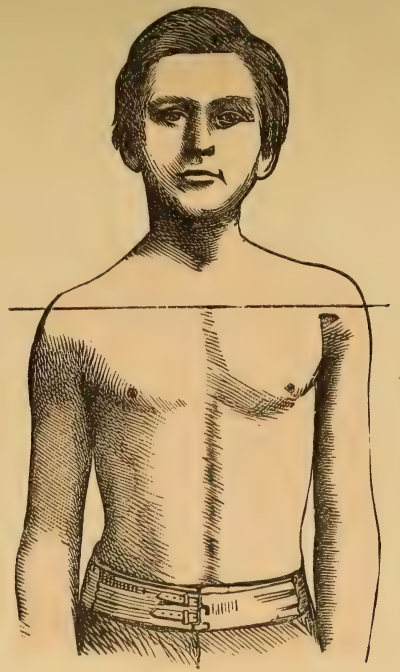


Fig. 1. Uneven Shoulders.

Fig. 2. Spinal Curvature.

useful. A man who is ambidextrous, or able to use both hands equally well, will not only be able to do more work in a day or in a year than a man who can employ but one hand, but in the case of the loss of one hand, he does not meet with so utter and complete a loss as the man who loses his one trained hand.

8. Even the brain and nerves share in the benefits derived from muscular training. When a muscle contracts, it is in obedience to the impulses originated in the brain, sent to the muscles along a nerve trunk. Hence, muscular exercise also implies exercise of the brain and nerves. The same law which induces muscular growth as the result of exercise, applies also to the exercise of the brain and nerves. Hence, muscular exercise, instead of detracting from mental development, as might be supposed, actually encourages the development of the brain, and increases its capacity for action. This is undoubtedly the reason why muscular exercise has so marked an effect in steadying the nerves, giving to one self-command, mental equipoise, and readiness. Nothing so well prepares one for readiness of action in emergencies as thorough training of the muscles.

9. The derivative effect of muscular exercise renders it one of the most efficient means of counteracting the effect of laborious mental occupation and such employments as are likely to cause an excessive flow of blood to the brain. When the muscles are active, they are capable of containing a much larger proportion of blood than when idle, and thus drain it away from the brain and nerve centers, which, through excessive and prolonged activity, may have become congested and surcharged

with blood. On this account, regular, systematic exercise is of the greatest value to students and to professional men. Thousands of men break down before completing their education, or just after graduation; and thousands of clergymen, lawyers, professors, and other brain workers, make disastrous failures in consequence of the onset of some nervous disorder, which might have been entirely prevented if the brain and nerve centers had been cooled and rested by regular systematic exercise.

10. Another of the valuable benefits to be derived from muscular exercise is to be found in its effects upon those portions of the nervous system which control the purely animal functions. An individual whose brain is excited and irritated by too much blood, the result of excessive brain work or worry, is vastly more likely to become a prey to the torments of propensities or passions clamoring for gratification, than he who, by active muscular exercise, relieves the brain of blood, thereby producing that gentle fatigue which is so conducive to rest and calmness of mind and body and soundness of sleep.

It is a noticeable fact that many wandering barbarous tribes, who depend for their sustenance upon the uncertain results of the chase and meager vegetable products, are vastly less addicted to gross vices, even though their food is largely of an animal character, than are more civilized people, whose mode of life requires of them less muscular exercise. This fact alone emphasizes the importance of encouraging muscular exercise among the youth of the present day, since the growing tendency to vice and licentiousness among all civilized people is

one of the most conspicuous and lamentable features of the present time.

General Rules for Exercise.—1. Exercise, to be really valuable, must be systematic; that is, it must be taken in such a way as to bring into play all the muscles of the body in a natural and symmetrical manner, or, in case the exercise is taken to correct deformities or special weaknesses, it should be such as will be best calculated to accomplish the desired end.

2. It must be taken regularly. The way most business men take their exercise, going off on a hunting expedition once a year for one or two weeks, or now and then taking a very long walk or a tiresome rowing excursion, is not calculated to strengthen the muscles, but rather to make them sore and stiff, and to discourage efforts in this direction.

Exercise should be taken daily. The system requires its daily dose of muscular exercise as much as its daily portion of food; and it would be quite as sensible to undertake to do a month's eating in a single day as to take all of one's exercise for a month on a monthly holiday. Hence, exercise should be taken daily, and if possible, at a regular hour.

3. The best time for taking exercise is about ten o'clock in the forenoon; but for an ordinary individual, the best time is at such an hour as will enable him to take it at the same time every day, thereby allowing the system to accustom itself to periodical muscular work, and so acquire the greatest amount of benefit from it. As a rule, especially with weak persons, a large amount of exercise should not be taken before breakfast. Persons who have a weak digestion, often

suffer ill effects from taking long walks before breakfast, becoming so "faint" that the relish for food is lessened as well as the power to digest it. For those who have active duties requiring their attention during the usual business hours, exercise may be divided between morning and evening; as half an hour before breakfast and an equal length of time before going to bed.

4. The amount of exercise should be such as will produce genuine fatigue. At the beginning, the exercise should be taken very moderately indeed, and the person should stop short of complete exhaustion. Weak muscles, in particular, should be exercised with very great care. Many persons become discouraged in their efforts in the direction of physical culture by attempting to do too much at first. In consequence of very violent exercise, the muscles are made sore and stiff, and they become discouraged, and give up the attempt in disgust.

At no time, during a course of physical training, should the exercises be so violent as to be exhausting; but they should be so gradually increased that the heaviest exercise at the last will be no more taxing than the very lightest at the beginning. This requires that the amount of muscular work done should be so carefully graduated that the muscles will have time to develop increased capacity as the work is increased.

A story is told of an ancient Roman who developed enormous strength by placing upon his shoulder a young calf, and carrying it around the ring of a great amphitheater. This he did each day; and as the calf grew in size, his strength increased proportionately, until at last he was able to shoulder the full-grown ox, and carry it about the great arena with almost as much ease as he had at first carried the animal when but a few days old.

PLATE XIV.

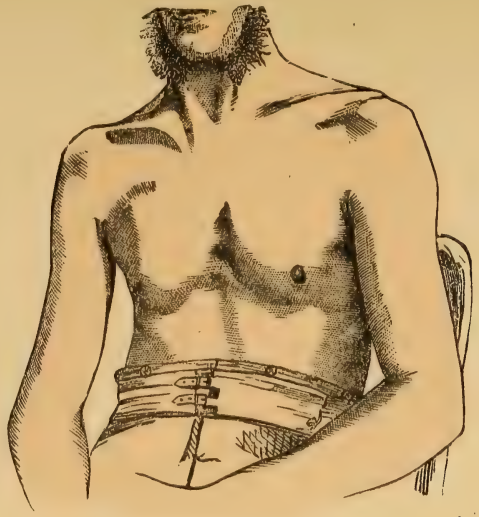


Fig. 1. Hollow Chest.

Fig. 2. Stooping Shoulders.

5. Much greater benefit is derived from light exercises repeated many times, than very violent exercises repeated but a few times, or engaged in only for a brief length of time. By lifting heavy weights, or indulging in such exercises as are too heavy for the muscles, they may be strained and even permanently injured; while by the employment of light exercises, though the body becomes fatigued, no such mishaps can possibly occur, and no permanent injury will be likely to be done.

Illustrious Examples.—Conspicuous examples of the benefits to be derived from systematic daily exercise are afforded by a number of eminent men of modern times, some of whom have already been mentioned.

Gladstone as a Wood-Chopper.—Gladstone, for example, is almost as famous for his fondness for, and dexterity in, chopping wood, as for his skill in diplomacy. Though he is upwards of eighty years of age, the venerable statesman continues as active as ever, and the quality of his speeches in the House of Commons shows not the slightest sign of physical or mental deterioration. When worn out with the labor and care of political life at London, he runs away to his home in the country, and spends a few days in hewing down the giant oaks for which the place is famous.

Dickens as a Pedestrian.—Dickens was almost as noted as a pedestrian as he was distinguished as a novelist. His daily habit was to walk nine or ten miles before breakfast, and he sometimes prolonged his walk to twenty-five or thirty miles before taking his morning meal. If he had not been given to great excesses in eating, it is probable that he might have prolonged his active literary life many years; but he was cut off at an age when most men of science are doing their best work.

Byron, though addicted to many vices, and even to the grossest dissipation, was a most faithful observer of the laws of health which relate to physical exercise, taking habitually a daily run into the country, and engaging in rowing, swimming, and other active physical exercises. He carried his physical training to such a degree of perfection that he was able to accomplish some feats in swimming which have rarely been equaled. It is quite probable that his attention to physical exercise, together with his habitual abstemiousness in diet, at least during long periods, enabled him to resist so long as he did the evil influence of the enormous excesses to which he was addicted.

Maclaren, the English apostle of physical education, in his excellent work on the subject, gives several illustrations of the remarkable effects of exercise in modifying the development of the body, a few of which we quote :—

"Twelve non-commissioned officers, ranging in age from nineteen to twenty-nine years, were sent to me for training. I made careful measurements of the chest, arms, shoulders, limbs, etc., and repeated the measurements at intervals throughout the course of training, to ascertain the amount of progress made." He states the result as follows :—

"The muscular additions to the arms and shoulders and the expansion of the chest were so great as to have absolutely a ludicrous and embarrassing result; for before the fourth month, several of the men could not get into their uniforms, jackets, and tunics without assistance, and when they got them on, they could not get them to meet down the middle by a hand's breadth. In a month

more they could not get into them at all, and new clothing had to be procured, pending the arrival of which the men had to go to and from the Gymnasium in their great-coats. One of these men had gained five inches in actual girth of chest. Now, who shall tell the value of these five inches of chest,—five inches of additional space for the heart and lungs to work in? There is no computing its value, no power of computing it at all; and before such an addition as this could be made to this part of the body, the whole frame must have received a proportionate gain. For the exercises of the system are addressed to the whole body, and to the whole body equally; and before this addition could be made to the chest, every spot and point of the frame must have been improved, every organ within the body must have been proportionately strengthened.

"But I tried another method of recording the results of the exercises. I had these men photographed, naked to the waist, shortly after the beginning of the course and again at its close, and the change in all, even in these small portraits, is very distinct, and most notably so in the youngest, a youth of nineteen, and, as I had anticipated in him, not merely in the acquisition of muscle, but in a re-adjustment and expansion of the osseous frame-work upon which the muscles are distributed.

"But there was one change, the greatest of all, and to which all other changes are but means to an end, are but evidences more or less distinct that this end has been accomplished,—a change which I could not record, which can never be recorded, but which was to me, and to all who had ever seen the men, most impressively

evident; and that was the change in bodily activity, dexterity, presence of mind, and endurance of fatigue, —a change a hundred-fold more impressive than anything the tape-measure or the weighing chair can ever reveal."

Exercise Encourages Growth.—The same eminent authority also gives the following illustrations of the effect of exercise in stimulating growth:—

"A remarkable instance of this came under my observation a few years ago. A youth whose growth had for some time been stationary at the hight of five feet two and three-eighths inches, suddenly, from the practice of systematized exercise, began to grow at a fair and regular rate, and at the age of twenty-one, when he went to India, his hight was five feet six and a fourth inches. Another instance is that of a school-boy whose growth had been all but arrested from a severe fall in childhood. Almost instantly, systematized exercise started his latent powers of growth, and in nine months he had grown eight and seven-eighths inches.

The eminent poet, William Cullen Bryant, who died a few years since at the advanced age of eighty-four years, preserved his wonderful physical and mental vigor to the very last, by a system of regular physical exercise, which he thus described in a letter to Mr. Joseph H. Richards, a few years before his death, and which was published after his decease:—

"*My dear Sir,*—I promised some time since to give you some account of my habits of life, so far, at least, as regards diet, exercise, and occupation. I am not sure that it will be of any use to you, although the

PLATE XV.

Fig. 1. Pigeon Breast.

Fig. 2. Front View of Same.

system which I have for many years observed seems to answer my purpose very well. I have reached a pretty advanced period of life, *without the usual infirmities of old age*, and with my strength, activity, and bodily faculties generally, in pretty good preservation. How far this may be the effect of my way of life, adopted long ago and steadily adhered to, is perhaps uncertain.

"I rise early, at this time of the year about half-past five; in summer, half an hour, or even an hour earlier. Immediately, with very little encumbrance of clothing, I begin a series of exercises, for the most part designed to expand the chest, and at the same time call into action all the muscles and articulations of the body. These are performed with dumb-bells, the very lightest, and covered with flannel, with a pole, a horizontal bar, and a light chair swung around my head. After a full hour, and sometimes more, passed in this manner, I bathe from head to foot. When at my place in the country, I sometimes shorten my exercises in the chamber, and, going out, occupy myself for half an hour or more in some work which requires brisk exercise. After my bath, if breakfast is not ready, I sit down to my studies till I am called. * * *

"After breakfast, I occupy myself for awhile with my studies, and then, when in town, I walk down to the office of the *Evening Post*, *nearly three miles distant*, and after about three hours, return, always walking, *whatever be the weather or the state of the streets*. In the country, I am engaged in my literary tasks till a feeling of weariness drives me out into the open air, and I go upon my farm, or into the garden and prune the fruit-

trees, or perform some other work about them which they need, and then go back to my books. *I do not often drive out, preferring to walk.*"

A former business associate gave to a newspaper representative the following, among other reminiscences of Mr. Bryant, with whom he had been acquainted forty years :—

"During the forty years that I have known him, Mr. Bryant has never been ill,—never been confined to his bed, except on the occasion of his last accident. His health has always been good.

"Mr. Bryant was a great walker. In earlier years, he would think nothing of walking to Paterson Falls and back, with Alfred Pell and James Lawson, after office hours. He always walked from his home to his place of business, even in his eighty-fourth year. At first he would n't ride in the elevator. He would never wait for it, if it was not ready for the ascent immediately on his arrival in the building. Of gymnastic exercises, he was very fond. Every morning, for half an hour, he would go through a series of evolutions on the backs of two chairs placed side by side. He would hang on the door of his bedroom, pulling himself up and down an indefinite number of times. He would skirmish around the apartment after all fashions, and once, he told me, even 'under the table.' Breakfast followed, then a walk down town; and then he was in the best of spirits for the writing of his editorial article for that day."

In view of such facts, where is there a young man of energy and intelligence, and for such only we write, who is not willing to devote the little time and effort required to develop for himself that soundness of body,

that suppleness of limb, that hardness of muscle, that grace and dignity of carriage, that soundness of digestion, and that vigor of intellect which can only be obtained by regular, systematic, vigorous muscular training? The question may arise, "Will not ordinary labor answer the purpose as well as special exercises?" In reply to this question, we have to say, Many kinds of labor afford a sufficient amount of bodily exercise to secure a good appetite, a vigorous digestion, and many other good results of exercise; but there are very few trades which do not, to a greater or less degree, destroy the symmetry, if they do not more seriously deform, the body. For example, the farmer, from the enormous amount of back-work he has to do in stooping forward and lifting with a fork and shovel, pulling the rake, swinging the scythe, etc., becomes round-shouldered. The back muscles become enormously developed, while the muscles of the front of the chest are neglected. Thus it is that we find so large a proportion of persons who are past middle age, presenting round shoulders, flat chests, and a backward curvature of the spine. The blacksmith develops one arm and one side of the chest enormously, but gives so little work to the other that he really becomes in time deformed. The oarsman develops the muscles of the back and fore-arm, and gives to the upper-arm and muscles of the front of the chest an insufficient amount of work; consequently, the shoulders become pulled forward. The fingers, also, in continually clasping the oars, become more or less permanently crooked and their bones stiffened. The average farmer also has an awkward gait, and is slow and awkward in his movements generally.

It thus appears that the laboring man, as well as he whose employments are sedentary, requires exercise for the purpose of counteracting the deforming tendencies of his particular vocation, and for preserving a well-balanced development of his body.

How to Make a Home Gymnasium.—The idea that expensive appliances and apparatus, and perhaps a building constructed expressly for the purpose, is required to enable a person to avail himself of the advantage of special exercise, has deterred many from undertaking a course of physical training. It is of the utmost importance in the interests of physical education that the public mind should be disabused of this erroneous notion. The truth is that the most essential and effective forms of exercise can be taken by the aid of little or no apparatus of any description, or at least other than that which can be afforded by any home, which are accessible to any one under almost all circumstances. However, the expenditure of a few dollars and a little labor will provide a few simple devices by means of which the work may be made more interesting and in some respects more effective. Hence, we shall describe a few appliances which it is desirable that every home should contain.

Every home ought to have its family gymnasium,—a room set apart for daily exercise, and which may be used by the members of the family. Such a room should contain,—

1. Apparatus for pulley-weights, which consists of a long box set upright against the wall, and divided perpendicularly into two compartments, which are open in front. At the top of each compartment is placed a

PLATE XVI.

Fig. 1. Imperfectly Developed Chest.

Fig. 2. Same after Training.

pulley, over which passes a rope, with one end attached to a wooden box about six inches deep and of sufficient size to fill the compartment. At the other end of the rope is placed a handle to grasp with the hand. Weights of different sizes can be put into the box so as to regulate the amount of work done, in pulling them up and down. Fig. 2, PLATE X., shows an apparatus of this sort.

2. Erect two solid posts about three feet broad. Place between the two posts, properly secured at a point as high as can be reached by the hand, a round bar about one and one-half inches in diameter. The bar may easily be made adjustable, so as to accommodate persons of different hights. Secure on the inside at a point about opposite the waist, a stout round pin about one and one-half inches in diameter, projecting from the post about eight or nine inches. A door-way may be used instead of the posts, as shown in Fig. 1, PLATE X.

3. Obtain a sound piece of ash or hickory about three inches wide, two inches thick, and six feet in length. Place this against the base board at one side of the room, and secure one end firmly to the floor. Above the free end of the strip, and high enough to be opposite the breast, fasten to the wall a block about four inches square and two inches thick. Obtain a fork handle about three feet in length. Bore a half-inch hole about one-third its length from one end, and pass a bolt through the handle into the block. By means of a stout rope, attach one end of the round piece to the free end of the strip upon the floor. The appearance of this apparatus, when complete, is shown in outline in Fig. 3, PLATE X.

4. Obtain a dozen iron weights weighing from one to ten pounds each. If iron weights cannot be easily procured, stone or lead may be employed; or bags filled with salt or sand, with the weight marked upon each, may be used instead.

5. If possible, obtain two or three pair of dumb-bells, one pair weighing five pounds each, another weighing eight pounds, and still another weighing twelve pounds.

By means of these simple appliances a very large proportion of the muscles may be brought into full and vigorous action.

Exercises to Develop Special Parts of the Body.—Many persons imagine that it is of very little consequence what form of exercise is taken, provided a person takes a sufficient amount to insure activity of the circulation, and secure an appetite for food. This is a grave error. A man might sit down by the road side, and spend ten hours a day breaking stones with a hammer, as men may often be seen doing on the roadways of England, and the active exercise may give him a good appetite, sound digestion, and strong muscles in his right arm; but the result would be that the rest of his body would, through neglect, become seriously deformed. His limbs would become stiff, and his gait feeble and awkward, and all symmetry of form and grace of movement would be lost.

In order that the body should be properly developed, it is important that each individual shall take such special exercises as are particularly adapted to his case, and in such amount as the general system, or the organs specially involved, may demand. By this means, particular

deficiencies or weaknesses may be corrected. To enable the reader to appreciate the need of special exercises for the purpose named, we have illustrated the text with a number of plates, for which we are indebted to the admirable work on Physical Education, by Archibald Maclaren, of England. The plates represent some of the most common errors in development which require correction by the proper employment of muscular exercise.

Fig. 1, PLATE XI., shows the upper part of the trunk and arms of a well-developed man. Fig. 2, PLATE XI., shows a well-developed arm in such a position as to exhibit the biceps, or large muscle of the front arm, to best advantage.

Fig. 1, PLATE XII., is from a photograph of a young man whose muscles were soft, flabby, and undeveloped. Compare the arms and shoulders of this figure with those of Fig. 1, PLATE XI. Fig. 2, PLATE XII., gives a back view of a young man with drooping shoulders.

Fig. 1, PLATE XIII., shows the effect of neglect of exercise in producing distortion of the body, the right shoulder being considerably lower than the left, owing to the weakness of the left side. Fig. 2, PLATE XIII., shows curvature of the spine from the same cause.

Fig. 1, PLATE XIV., exhibits the effect of neglecting the development of the muscles of the chest and arms, producing a flat and hollow chest. Compare this with Fig. 1, PLATE XI.

Fig. 2, PLATE XIV., gives a back view of a person with a hollow chest.

Fig. 1, PLATE XV., gives a side view of a small

boy with the peculiar deformity known as "pigeon's breast." Fig. 2, PLATE XV., shows a front view of the same deformity.

Fig. 1, PLATE XVI., shows the appearance of a young man with an imperfectly developed chest. Fig. 2, PLATE XVI., shows the same individual after a few months' practice of exercises calculated to develop the chest and improve the physique.

Forms of Exercise.—The limited space which we have to devote to this subject will admit only a brief description of a few of the simplest and most valuable forms of exercise. Fortunately, the most important forms of physical exercise can be taken with very little apparatus, and are very simple in character.

Walking.—This simplest of all forms of exercise is one in which a large number of the muscles of the body are brought into gentle action, in maintaining the erect position of the body, and propelling it forward. In ordinary walking upon a level surface, the body is not lifted, but is inclined forward in such a way as to make it necessary for the feet to be advanced, first one and then the other, in order to preserve the body from falling. (Figs. 1 and 2, PLATE XVII.) Walking is a valuable form of exercise, but is so gentle in character that a large amount must be done, at least several miles a day, to constitute a fair amount of exercise.

Walking, to be beneficial, must be graceful. There are very few good walkers, since few persons have an equable muscular development, which is necessary for a graceful carriage in walking. If the limbs are weak, the gait is tottering. If there is weakness of the muscles of the waist, the body sways from side to side

Fig. 1.

Fig. 2.

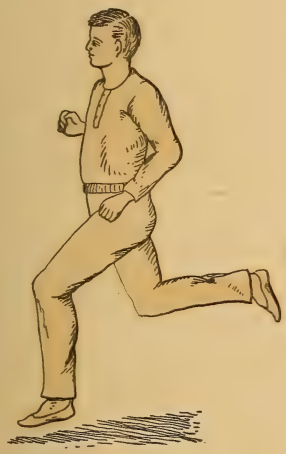


Fig. 3.

Fig. 4.

PLATE XVII.

in walking. Weakness of the muscles of the front of the trunk cause the head and shoulders to be thrown forward.

How to Walk.—To walk healthfully, first make the body erect by throwing the shoulders well back and the chest forward, holding the head erect and drawing the chin in a little. This will straighten the muscles of the back, and give to the body an erect carriage. Let the arms swing easily by the side, with the palms open and turned inward. In stepping forward, place the foot down firmly, letting the heel touch first, then the toe. Avoid a tettering gait by keeping the knees well set back. Put vigor and elasticity into the step. At the beginning, let the pace be moderate, and the distance not greater than can be accomplished without severe fatigue. Gradually increase the distance and the speed until able to walk four or five miles an hour. The amount of exercise obtained in walking may be regulated by the speed and distance of the walk. The amount of work done may be increased by carrying loads of different weights, either in the hands or upon the shoulders.

Running, leaping, and hopping are modifications of walking which afford much more vigorous means of exercise than ordinary walking. A person who has not been accustomed to violent exercise of any sort, should carefully avoid an excessive amount of this kind at the beginning of practice. In running, the gait should at first be very moderate, and the distance traversed short, so as to give the heart and lungs opportunity to become strong enough to sustain the increased effort required of them during this active exercise. The same observation

holds good respecting hopping and leaping. The proper positions in running are shown in Figs. 3 and 4, PLATE XV.

Dumb-Bell Exercises.—The dumb-bell is a very useful appliance for exercising the arms. (Fig. 1, PLATE XVIII.) It was used by the ancient Greeks, who gave much attention to exercise of all sorts. Figs. 2, 3, PLATE XVIII., show the forms of the instrument as employed in ancient times. Fig. 4, PLATE XVIII., shows a form of dumb-bell used by the Chinese. Two systems of exercises are employed with dumb-bells, one requiring light bells made of wood; the other, heavy bells made of iron. For active and prolonged exercises of the arms, wooden bells are to be preferred; but for exercises intended to develop particular muscles, iron bells, properly adapted to the strength of the individual, are much preferable. In the use of iron dumb-bells, the weight should at first not exceed one twenty-fifth that of the body. It may be increased until at the end of five or six months, the weight of each bell is one-tenth that of the body. Thus, a person weighing one hundred and twenty-five pounds should, at the beginning, use dumb-bells weighing five pounds each, and should gradually increase the weight to twelve and one-half pounds. For most of the exercises in which dumb-bells are used, bags of shot, cobble-stones, or other objects, the weight of which has been determined, may be used with equally good results, though they are far less convenient.

Exercises with Dumb-Bells.—The positions of the arms in taking some of the various forms of exercise may be readily seen by reference to Figs. 1 and 2, PLATE XIX. That the Chinese were acquainted with this

form of calisthenics, may be seen by reference to Fig. 1, PLATE XX., which the author has copied from a remarkable work in the Chinese language that was published in China some hundreds of years ago. For this interesting volume the author is indebted to Hon. John Freyer, A. M., of Shanghai, China, who discovered it in the native book stores of that country. In using bells, the following program may be followed :—

Position : Heels together, knees well set back, shoulders thrown back, head erect, chest well expanded.

1. Grasp a bell in each hand (wooden dumb-bells) ; bring the hands to the sides, with the palms in front; twist arms half around and back four times, bringing hands to the hips with the last movement.

2. Arms extended at the sides, palms inward ; turn bells and return four times.

3. Arms extended to the front; palms upward; turn bells four times.

4. Arms extended directly up from the shoulders, palms front; turn four times, bringing bells to the chest with last movement.

5. Bells on chest near the shoulders ; thrust right hand down to the side and return four times.

6. Repeat with left arm, keeping the right in position.

7. Alternate the two hands, each twice.

8. Thrust both hands downward four times.

9. Bells at armpits. Thrust the right hand down to the side four times, keeping the left in position.

10. Repeat with left hand.

11. Alternate the two hands, each twice.
12. Thrust down both hands four times.

13. Place bells on shoulders. Thrust right hand up four times.
14. Repeat with left hand.
15. Alternate the two hands, each twice.
16. Thrust both hands upward four times.

17. Bells at sides, palms inward; swing each hand up to horizontal four times.
18. Repeat with left hand.
19. Alternate each twice.
20. Swing both at once four times.

21. Hands at sides, palms inward; bring right hand up in front to horizontal four times.
22. Repeat with left hand.
23. Alternate the two hands, each twice.
24. Swing with both hands four times.

25. Hands at side, palms inward; swing each hand backward as far as possible four times.
26. Repeat with left hand.
27. Alternate with two hands, each twice.
28. Swing both hands four times.

29. Arms horizontal, palms inward; swing right arm up to perpendicular.
30. Repeat with left hand.
31. Alternate with two hands, each twice.
32. Swing both arms together to perpendicular four times.

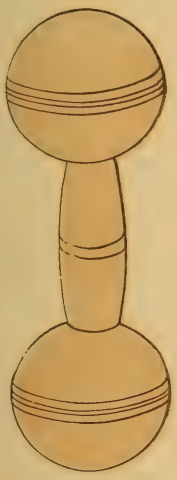


Fig. 1.

Fig. 2.

Fig. 3.

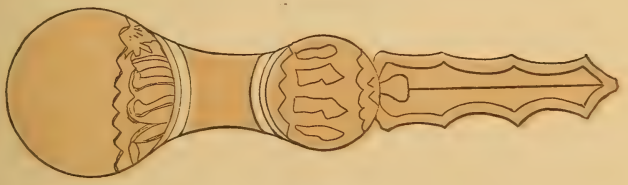


Fig. 4.

PLATE XVIII.—Ancient and Modern Dumb-Bells.

33. Extend arms in front, palms inward; swing each hand up to perpendicular.

34. Repeat with the left hand four times.

35. Alternate the two hands, each twice.

36. Swing both hands together four times.

37. Hands extended in front, palms inward; swing right hand back as far as possible four times.

38. Repeat with left hand.

39. Alternate the two hands, each twice.

40. Swing both hands together four times.

41. Hands at the sides, palms forward; swing each hand to perpendicular four times.

42. Repeat with left hand.

43. Alternate the two hands, each twice.

44. Swing both hands four times.

Anvil Chorus.—A pleasant variation of the exercise with wooden dumb-bells may be made by striking the bells together, as indicated in the following program:—

1. Extend left arm in front, holding the right bell touching the shoulder blade back of the head. Strike left bell down with the right, allowing the right bell to fall in same position as that of the left, bringing the left into the position previously occupied by the right. Repeat same with left bell, and thus alternate four times.

2. Hands at sides; palms outward. Swing arms to perpendicular, striking bells together over head four times.

3. Repeat No. 1.

4. Strike bells in front, then behind, each four times.

5. Repeat No. 1.

6. Extend arms in front. Strike the upper end of the left bell with the lower end of the right bell. Repeat with left bell. Alternate thus four times.

The exercises should be accompanied by counting thus: One and, two and, three and, four and; and then repeating. The time may be kept by the aid of music, which is especially serviceable where several are taking the exercises together. Polkas, marches, or any well accented instrumental music in two-four or four-four time is suitable.

Numerous other exercises may be taken with dumb-bells besides those described; and the exercises may be varied by assuming various positions, such as stepping out in front with one foot or to the side or behind, as shown in Fig. 2, PLATE XIX.

Indian Club Exercises.—The Indian club, like the dumb-bell, has been in use from remote times. This fact may be inferred from the drawing shown in Fig. 2, PLATE XX, which is a reproduction from a drawing in a very ancient Chinese work on exercise, in the possession of the author, for which he is indebted to Hon. John Fryer, of Shanghai, China, editor of the *Pekin Magazine*, and translator for the Chinese Government.

Indian club exercises are less easily learned than exercises with dumb-bells, but well repay the trouble required to become familiar with them. We have not space here to describe more than a few of the simpler movements. (See Figs. 3 and 4, PLATE XIX.)

1. Grasp the clubs firmly, allowing them to hang at the sides, palms inward; swing the right club up to horizontal in front; repeat four times. Do the same with the left arm. Alternate the two arms, swinging each twice. Swing both together four times.

2. Hands at the sides; swing right arm up to horizontal at the side. Repeat four times with left arm. Swing with arms alternately, each twice. Swing both together four times.

3. Place both arms together, horizontally in front. Follow same order of movements, swinging clubs to the perpendicular.

4. Placing the arms horizontally at the sides, repeat the same movements.

5. Place the clubs at the sides; swing right arm to perpendicular four times. Repeat with left arm. Alternate the two arms, swinging each twice. Swing both arms together, four times.

6. Hold the clubs in front horizontally. With the right arm make a sweep to the back as far as possible in a horizontal plane, and return to position; repeat four times. Do the same with the left arm. Alternate, swinging each twice. Swing both together four times.

7. Arms extended in front. Without bending the elbow, by a motion of the wrist bring the right club over toward the arm, allowing it to strike the arm, then carry it back into the original position. Do this four times. Repeat with left club, then alternate each club twice, and do the same with both together four times.

A very large variety of more complicated exercises with Indian clubs may be easily learned from works devoted to the subject. These exercises are specially serviceable in strengthening the muscles of the back and shoulders, expanding the chest, and correcting a tendency of the shoulders to fall forward.

EXERCISES TO DEVELOP PARTICULAR PORTIONS OF THE BODY.

To Strengthen the Arms.—The muscles of the arm are in more constant use than almost any other of the voluntary muscles; yet the amount of labor required in a great share of the exercises in which they are employed, is so small that they are often soft and flabby, and the arms poorly developed, notwithstanding their great activity. By the aid of special exercises, the arm may be developed to a very remarkable degree. A poorly developed arm lacks the graceful lines of beauty which are so conspicuous in the ancient Grecian models of the human form.

The Fore-Arm.—The fore-arm, or that portion of the upper extremity between the elbow and the wrist, is used in all exercises which require holding objects in the hand. This part of the arm is especially used in such exercises as hammering, planing, chopping, and driving. Pulling one's self up by the hands requires a powerful effort on the part of these muscles. But this is too powerful exercise for a beginner. Twisting movements of the arms, such as Exercises 1 to 4 with dumb-bells, and Exercise 7 with Indian clubs, are excellent means of developing the muscles of the fore-arm. Rowing, lifting, and carrying heavy weights in the hands are all exercises which strengthen the fore-arm.

The Inner Side of the Arm.—When the arm is bent, a mass of muscle can be felt by placing the other hand upon the arm between the shoulder and the elbow.

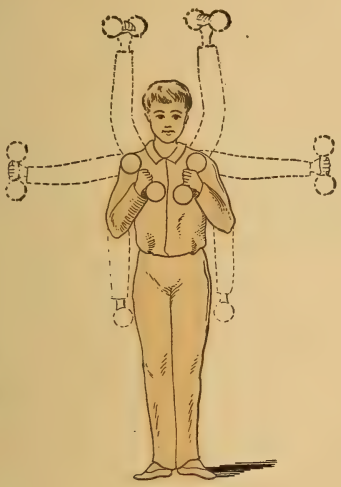


Fig. 1.

Fig. 3.

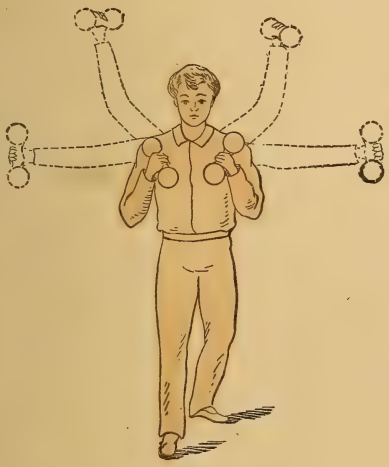


Fig. 2.

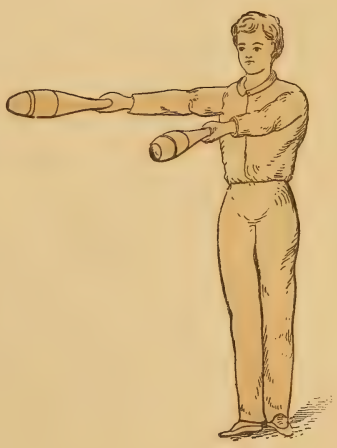


Fig. 4.

PLATE XIX.—Dumb-Bells and Indian Clubs.

When the muscles are relaxed, the flesh is soft; but when it is brought strongly into exercise, it is felt to contract and to harden under the hand. This muscle is known as the biceps. It is used in all movements which flex or bend the fore-arm, and is strengthened by nearly all exercises which develop this part. Exercises with dumb-bells are particularly adapted to develop this muscle :—

1. Take in the hands a pair of dumb-bells about one-twenty-fifth the weight of the body. Place the hands at the sides, standing with the chest well expanded and the head up. Slowly raise the dumb-bells up from the sides to the shoulders, and return to position. Repeat. After a few moments, rest and repeat the exercise until the dumb-bells have been raised and lowered forty or fifty times. As the strength increases, make the dumb-bells heavier, until those weighing ten to fifteen pounds each are used.

Exercises 5 to 16, made slowly with iron dumb-bells, rapidly increase the strength of the muscles used.

2. Pulling weights, arranged so that the handles hang from the ceiling, may be used with excellent effect to strengthen these muscles. The handles should be high enough so they can be just grasped with each hand. The weights should be light at first, but should be gradually increased. Bring the right hand down to the shoulder and return four times. Repeat the same with the left hand, the two hands, and then use both together. Repeat many times until the muscles have had work enough to make them tired. A single pulley-weight, drawn from above the head down to the breast, using both hands, may be usefully employed in alternation

with the double pulley-weights. Lifting weights with the hands, holding weights at arms-length, climbing a rope and hanging from a bar, or drawing one's self up by the hands, as shown in Figs. 1 and 2, PLATE XXI., are excellent exercises for these muscles. The last-named exercise should not be attempted, however, until the muscles have been made strong by carefully graduated exercises, which may be advantageously taken with the single pulley, increasing the weights from day to day until a weight equal to one-half that of the body can be readily lifted with one hand; then the whole body may be lifted by grasping a horizontal bar placed high enough above the head so it can be just reached, drawing the body up until the chin is level with the bar. Repeating this exercise several times will give the biceps all the work they require.

The Outer Side of the Arm.—This portion of the arm is more likely to be neglected than any other. When these muscles are not properly developed, the arm lacks that symmetrical roundness and plumpness which a well-developed arm possesses. The following are excellent exercises to strengthen them:—

1. Grasp the dumb-bells in the hands, and place them upon the shoulders. Keeping the left hand in position, carry the right hand to the horizontal and back slowly. Repeat four times. Do the same with the left hand. Alternate, and use both together, repeating as many times as desired.

2. Grasp the pegs shown at Fig. 1, PLATE X. Draw the feet up from the floor. Now let the body down, bending the arms. Straighten the arms, thus bringing the body back to position, still holding the feet

clear from the floor. Repeat the movement. This exercise is known as "dipping." It is one of the most efficient means of bringing the muscles of the outer arm into active exercise. In the absence of more convenient means, it may be practiced by supporting the body by grasping the backs of two chairs placed a little ways apart. At the first attempt, two dips will be sufficient to make the muscles thoroughly tired. The number should be gradually increased until forty or fifty dips can be made without touching the feet to the floor. When this can be accomplished, the muscles employed may be considered in good condition. Such exercises as pushing heavy weights and striking a sand bag with the fist are well calculated to develop the muscles of this part of the arm.

The Shoulders.—The front and sides of the shoulders are vigorously exercised in holding weights at arms-length, and swinging the ax in chopping. Dumb-bell Exercises, Nos. 17 to 44, and Indian Club Exercises, Nos. 1 to 6, are particularly useful in developing the shoulders. The upper and back part of the shoulders and upper part of the back may be developed by the use of dumb-bells, pulley-weights, and particularly by rowing. The following excellent exercises strengthen these muscles :—

Grasp the dumb-bells (iron dumb-bells). Place them at the sides, carrying the arms backward as far as possible. Stooping work, combined with lifting, such as shoveling, breaking stone, and many other laborious occupations, develops these muscles powerfully. Lifting weights, when the body is erect, brings strongly into exercise the large muscle at the back of the neck.

The Fingers.—The fingers may be strengthened by lifting weights, grasping by the thumb and fingers only, or holding the weight with one finger by means of a ring or loop; by the use of the pulley-weights, using one finger only, instead of the hand; by supporting the body in a hanging position, grasping the edge of a board, as a rafter in the garret, or a floor joist overhead in the cellar.

To Develop the Sides of the Waist.—A man who is weak at the sides of the waist sways from side to side as he walks, particularly when walking fast; hence these muscles may be strengthened by rapid walking. Hopping, first on one foot and then on the other, continuing the exercise until one-half or three-fourths of a mile can be traversed in this way, is an excellent means of strengthening the muscles of the sides of the waist. Walking on the edge of the top board of a fence, or the iron rail of a railroad track, or a tight rope, with a balance pole, gives these muscles very active and improving exercise.

Balancing a weight upon the head while walking is also an excellent means of strengthening the muscles of the waist, as well as of the neck and back. The author has often seen in the large cities of Germany, men and women carrying ponderous weights upon the head, and always remarked the wonderful erectness and steadiness of gait which these persons possessed. The simple apparatus shown at Fig. 3, PLATE X., devised by the author for the purpose of exercising and strengthening the side muscles, is in use in the gymnasium of the Sanitarium, at Battle Creek, Michigan. The muscles of the sides are called into vigorous action in energetic

Fig. 1. Chinese Gymnast.

Fig. 2.

walking, with body erect and shoulders back, especially if the feet are raised high in stepping.

To Strengthen the Muscles of the Abdomen.—The following exercises are particularly good to strengthen these muscles :—

1. Sit on the side of a chair, placed close to the wall, so that the toes may touch the base board. Sit erect with the body rigid. Place the hands upon the hips. Let the body fall slowly backward, and after a few seconds, return to an erect position. After some practice, the body can be lowered to a horizontal plane and restored again to position with great ease. The exercise should be repeated a greater number of times as the muscles become stronger.

2. Fasten a couple of loops to the base board, each large enough to admit the foot. Place a low stool at such a distance from the wall that when one sits upon it with the limbs extended, the feet can be placed in the loops. Now place the hands upon the hips, and sway the body back and forth.

3. Lie on the back on the floor or on an ordinary bench. Fill the lungs by taking a deep breath. Keep the legs stiff. Place the hands upon the hips. Raise the trunk slowly to the perpendicular, and slowly return to the horizontal. Repeat several times. The vigor of this exercise may be much increased by placing weights upon the shoulders.

4. Stand erect. Place the hands upon the hips, and bend backward as far as possible. Then bring the body to the perpendicular. This not only exercises the abdominal muscles, but stretches them when they have become contracted, and corrects flatness and posterior

curvature of the spine, which are indicated by a sunken-in appearance of the lower part of the chest.

5. Other exercises, such as swinging clubs, using dumb-bells, chopping, pushing with the hands, etc., also strengthen these muscles.

To Strengthen the Back and Loins.—A person who is weak in the back, needs such exercises as will strengthen the muscles on either side of the spine and the lower part of the trunk. These very important muscles are called into action in nearly all kinds of work. One who is weak, very easily strains the muscles by some extra exercise, giving rise to much pain and suffering, which shows the importance of making them stronger by special exercises calculated to develop them.

1. Sit upon a stool with the feet secured by loops fastened to the floor. Place the hands upon the hips, and bend the body slowly forward and back to position several times. Bend the body backward in the same way, and to either side, repeating each movement a number of times. Or, stand erect, the feet half or two-thirds of a yard apart. Clasp the arms above the head, and sway the body back and forth and from side to side. (See Fig. 3, PLATE XXI.)

2. Standing against the wall, place the hands upon the hips and bend the head down as far as possible without bending the knees. If the muscles of the back are rigid, it would be well to have an assistant press the head down a little farther when the body has been bent as much as possible. (See Fig. 4, PLATE XXI.)

3. Stand a foot or two from the the wall. Lean against the wall, supporting the body by the head, keeping the trunk and limbs rigid, as shown in Fig. 1, PLATE XXII.

4. Place two low stools far enough apart so that the difference between them will be about six inches less than the hight of the body. Now lie down, and place the feet upon one and the head upon the other, so that the body will be supported between the two, as shown in Fig. 4, PLATE XXIII.

5. Place the body in the position shown in Fig. 5, PLATE XXII., the feet being placed under the edge of a sofa. Now inflate the lungs, and bend forward to the floor. Return to position and repeat.

6. An excellent exercise to strengthen the muscles of the neck and back is shown in Fig. 2, PLATE XXII.

7. The muscles of the loins are developed by the use of dumb-bells, Indian clubs, and pulley-weights, as well as by such occupations as hoeing, shoveling, lifting, carrying weights, etc.

To Expand the Chest.—Attention should be given to the chest, in connection with all other exercises, by taking care to keep the shoulders back, and filling the lungs before taking any exercise. The following exercises are calculated to broaden the chest:—

1. The use of dumb-bells at arms-length, with the head well thrown back, and the face looking toward the ceiling.

2. Long and deep breathing, many times repeated, the effect of which may be increased by drawing in and expelling the air through a small tube.

3. Swinging by the hands from a horizontal bar, or from the top of a door. (Fig. 1, PLATE XXI.)

4. Standing in a door-way, place the hands upon either side above the head, as shown in Fig. 3, PLATE XXIII. Raise one foot and place it forward, as shown

in the cut, at the same time energetically throwing the whole trunk forward. Repeat the movement several times.

5. Arrange two pulley-weights so that the handles will hang from the ceiling at such a hight above the head that they can be just reached by the hands when stretched perpendicularly. Grasp the handles with the palms outward, and lower the arms to horizontal, keeping them well extended. After holding several seconds, return to the original position, and repeat.

6. To increase the depth of the chest, no exercise is superior to the use of the single pulley. Attach a bar to the end of the rope. Grasp this with both hands placed about one foot apart. Draw the bar down from above the head to the chest, and return to position. The weight should be gradually increased until it amounts to one-half the weight of the body. All exercises with the arms enlarge the chest by pulling upon the ribs; but of all exercises described in this chapter, none are of greater importance than those which develop the breathing capacity.

7. In Fig. 5, PLATE XXIII., is illustrated an admirable movement for developing the muscles of the chest and back. The weight is partly sustained by the hands, which grasp the top of a bed post, or a ring fastened in a wall or post. The movement consists in swinging the body, making the hands and feet the center of this motion. The movement may be varied by allowing the body to fall slowly forward, the arms bending at the elbow, and then straightening the arms, and bringing the body to position again. This movement not only strengthens the muscles of the chest, but also the muscles of the abdomen and back.

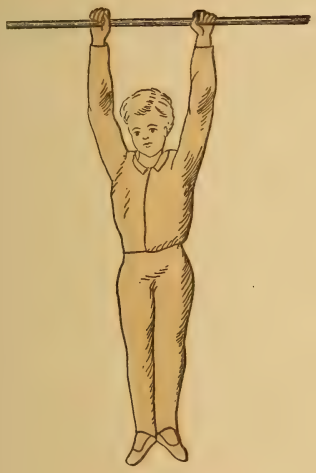


Fig. 1.

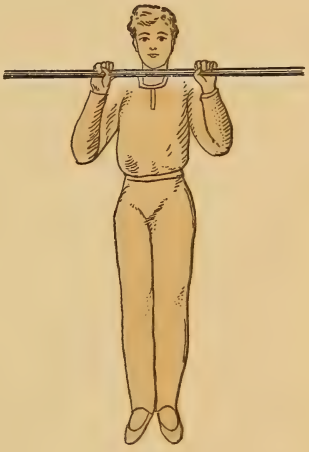


Fig. 2.

Fig. 3.

Fig. 4.

PLATE XXI.

Fig. 3, PLATE XXII., shows still another exercise which is admirably calculated to strengthen and expand the chest.

To Develop the Legs.—1. The calf of the leg is not much used in ordinary walking, but by keeping the knees well sprung back, and making a little push with the rear foot at the same time that the forward foot is being placed in position, which may be termed "push-walking," the calf may be brought into very active and vigorous exercise. Running fast, hopping, jumping, and leaping also bring the muscles of the calf into active exercise.

The simple exercise shown in Fig. 1, PLATE XXIII., which consists in rising slowly to a position known as toe-standing, then slowly lowering again and repeating, brings the muscles of the calf into vigorous exercise. This movement should be repeated from fifty to five hundred times to secure the proper amount of exercise.

2. The muscles of the front side of the calf are not used in ordinary walking; but in fast walking, walking with the knees well sprung back, in stooping and in balancing, these muscles are powerfully exercised. They are also brought into full play by standing and walking upon the heels. Standing upon the heels and holding weights upon the toes is another means of giving these muscles special work.

3. The muscles of the front of the thigh are specially exercised in running, jumping, and fast walking. They may be well exercised by standing with the back to the wall, bending up one leg and placing the foot against the wall, and alternately contracting and relaxing the muscles of the bent leg, pushing the body away from the wall, and allowing it to fall back into position.

4. The muscles at the back of the thigh are exercised in push-walking, in bending forward with the knees well sprung back until able to touch the floor with the hand (this is an essential part of what is known as the "setting up drill," to which fresh cadets at West Point and other military schools are subjected), and walking with weights attached to the foot, or using the pulley-weights with the foot. In throwing the foot violently forward, as in kicking, these muscles are vigorously exercised.

5. An excellent exercise for the feet is shown in Fig. 2, PLATE XXIII. It consists in bending the leg at the knee, thus throwing the weight upon the foot, which is braced against the wall, called half-knee bending.

Daily Exercise for a Young Man.—The following represents about the amount of exercise which a young man engaged in sĕdentary habits should take each day to keep himself in good health :—

1. Toe-rising and breathing, arms raising, ten times.
2. Lifting one-fifteenth of body-weight dumb-bells, fifty times.
3. Toe-rising and breathing, ten times.
4. Half-knee bending, fifty times.
5. Toe-rising and breathing, ten times.
6. Dumb-bells backward lifting and holding, fifty times.
7. Toe-rising and breathing, ten times.
8. Dumb-bells upward raising from shoulders, fifty times.
9. Toe-rising and breathing, ten times.
10. Dumb-bells lowered from vertical to horizontal at sides, fifty times, resting after each ten times.
11. Walking two to five miles.

A Chapter on Ethics.

MORALITY.—The essence of morality is right doing, or the practical recognition of the obligation to law. Man is a part of the great universe, and is as much under the domain of law as the planets, rocks, trees, and other natural objects, or as the pebble, which, when thrown in the air, falls to the ground in obedience to the law of gravitation. Destructive agents of every description affect man as readily as though he were of no greater value than a senseless rock or a decaying log.

In addition to the general laws which relate to all natural objects, and to which man is subject in common with all other objects, man is governed by various special laws which relate to his physical, mental, and moral welfare. For example, his digestive apparatus, from its very nature, is able to work well and easily and effectively under certain conditions; while under others its activity is imperfect and inefficient. In other words, there are certain laws which relate to digestion, the infringement of which is visited by the penalty,—indigestion. So, also, certain laws regulate the activity of the muscles, the lungs, the heart,—every portion of that

delicately contrived machine which we call the body. It is also evident that the mind, which is intimately related to the brain, acts in accordance with certain well-defined laws; and a failure to observe this fact often results in serious and sometimes irreparable injury. If it were not for the penalties which nature has attached to the violation of her laws, man would often abuse his body in the most gross and shameless manner, wholly perverting its functions and objects from the original intention of his Creator.

Pain a Blessing.—When we violate a physical law, nature warns us that we must cease wrong doing, and mend our ways. If we might thrust any portion of the body into a fire without being burned, how long would we be likely to escape serious injury from this destructive agent, as the result either of neglect or carelessness? If we heed the first hints of warning nature gives us, we may be protected from the grave injuries which often result from neglecting her warnings; but if we ignore the friendly warning of danger which nature gives whenever we go astray from the path of physical rectitude, in the form of pain, discomfort, or other unpleasant symptoms, nature after a time ceases to enter protest against the abuse to which she is subjected, leaving the body practically defenseless against the enemies of life and health with which it is surrounded.

Moral Law.—The moral nature, as well as the physical and mental, is also subject to various laws, the observance of which is necessary for its well-being. What these laws are, we need not stop to define, as they are epitomized in the most faultless manner in that wonderful crystallization of all moral principles and

Fig. 1.

Fig. 2.

Fig. 4.

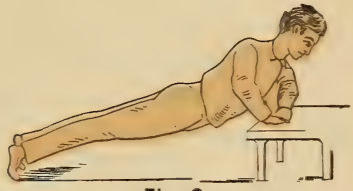


Fig. 3.

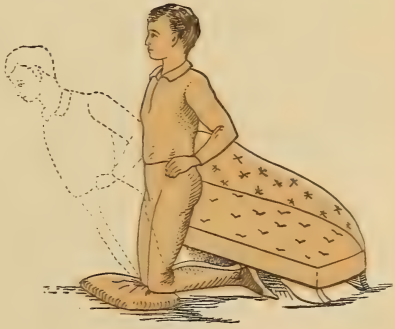


Fig. 5.

PLATE XXII.

precepts, the Divine Decalogue. Though graven in stone by the finger of the Almighty at Sinai, these rules for the moral direction of human beings were not there created, but, like those laws which relate to man's physical organism, were the outgrowth of his moral nature, the necessary consequence of the relations established between man and his fellow-man by the fiat of the Creator which brought him into existence. The violation of one of these moral principles must as certainly result in injury to the transgressor, as the violation of those laws which relate to his digestion, or to the activity of any of his bodily organs.

The idea that the Almighty made man, and then laid down certain arbitrary rules by which his moral acts should be governed, is a mistaken one. The dire consequences of sin are as much the result of the infraction of the principles which are the natural outgrowth of man's moral constitution, as the pain which follows the exposure of the flesh to mechanical violence, or the action of a chemical agent, is the result of the violation of those laws which relate to his physical constitution, and which govern the relations of his body to external things.

Those who find fault with the Almighty for making men subject to pain and suffering, physically, mentally, and morally, would do well to consider for a moment what would be the consequence if all penalties for wrong doing were abrogated. The patient, groaning with distress, looks upon pain as a calamity which he would gladly escape from if possible. The wise physician recognizes pain as one of man's best friends, since it warns him of his danger when pleasure or fancy allures

him from the straight road of physical rectitude. So, also, the moral physician looks upon the penalties of moral transgression, not as calamities, but as monitors, deprived of the influence of which, most human beings would quickly lose themselves in the mazes of moral turpitude.

Morality is generally looked upon as relating solely to those relations which are directly embraced in the injunctions of the ten commandments; but the view which regards man as a natural object, governed only by natural laws, and which defines right doing as being simply obedience to law, gives to the term *morality* an immensely broader scope, and makes it include all those laws and principles by which his entire being is governed.

This notion of morality is confessedly a modern one, or rather a revival of a primitive idea which was hidden so deep in the mental and moral darkness of the middle ages that it has only in modern times begun to reach the light. Less than a thousand years ago, physical and moral uprightness were supposed to be so far dissevered as to be actually antagonistic; and indeed, it is asserted that the idea that the degree of a person's holiness was to some extent proportionate to his lack of cleanliness, was once so prevalent among a certain class of religionists that to be extremely filthy in habits was considered more creditable than to be scrupulously neat.

Bogus Religion.—According to a recognized authority, St. Ignatius was accustomed to appear abroad "with old, dirty shoes. He never used a comb, but allowed his hair to clot, and religiously abstained from paring his nails. One saint attained to such piety as to have nearly three hundred patches on his breeches, which,

after his death, were hung up in public as an incentive to imitation. St. Francis discovered by certain experience that the devils were frightened away by such kind of breeches, but were animated by clean clothing to tempt and seduce the wearers; and one of their heroes declares that the purest souls are in the dirtiest bodies. Brother Juniper was a gentleman perfectly pious on this principle; indeed, so great was his merit in this species of mortification, that a brother declared that he could always nose Brother Juniper within a mile of the monastery, provided the wind was at the due point. Many stories are told of lions and other fierce beasts of prey rushing upon such holy men in the desert, but suddenly stopping in their career, and flying away with every sign of fear and terror; which may well be credited, the 'odor of sanctity' being too much for the olfactory nerves of a lion."

Genuine Religion.—A genuine morality is broad enough to take in the whole man, and demand self-respect, and obedience to all the laws relating to his welfare. This is genuine religion, pure and undefiled. The religion of Socrates, while embodying many and most excellent moral precepts, still gave license for the free gratification of the animal instincts, and ignored to a large degree the moral obligation to care for and discipline the body. The religion of Buddha, while stimulating its disciples to a high degree of self-control and self-abnegation, ignored the poor body as worthy but to be crucified or tormented, as a possible means of improving the soul. The religion of Mohammed, while imposing many sanitary obligations, pictures a heaven teeming with sensual pleasures. Nowhere else but in enlightened

Christianity is there to be found a religion broad enough to embrace a whole human being, an entire humanity.

Religion includes something more than simply morality. It includes not only belief in a higher Power, and in personal and individual obligations to the same, but a recognition of an individual dependence upon the higher Intelligence, and faith in His ability and readiness to afford aid and succor in times of need and distress. One of the most unhappy tendencies of the times is the growing disposition to skepticism, which is apparent to every one. Too often the young, dazzled by the achievements of science, and perplexed by the apparent discrepancies between natural and revealed truth, are led to reject the simple revelation of inspiration, and to exalt beyond their real importance the dicta of men of science. Others are beguiled by the wily but blasphemous sophistries of Ingersoll and his followers. A few months since, at a public meeting in London, at which our late minister to England, Mr. Lowell, was present, some of the speakers of the evening took occasion to sneer at religion, saying that they could get along without it, and depreciated its influence upon men. The admirable reply of Mr. Lowell was so effectual an answer to the arguments urged by those skeptics, that we take pleasure in quoting it as follows:—

Minister Lowell on Skepticism.—"I do not think it safe. I am formulating no creed of my own; I have always been a liberal thinker, and have, therefore, allowed others, who differed from me, to think also as they liked; but at the same time I fear that when we indulge ourselves in the amusement of going without a religion, we are not, perhaps, aware how much we are sus-

Fig. 1.

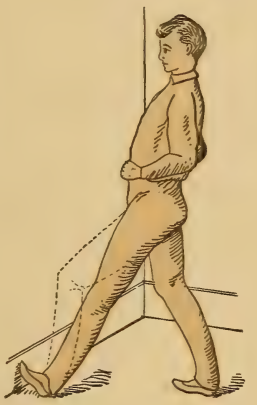


Fig. 2.

Fig. 3.

Fig. 4.

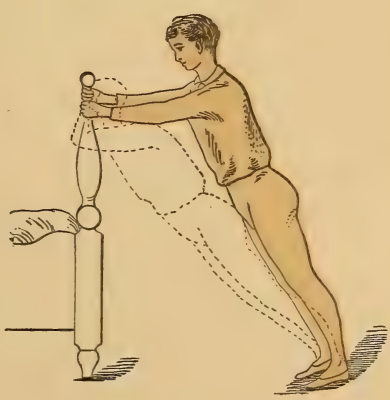


Fig. 5.

PLATE XXIII.

tained at present by an enormous mass, all about us, of religious feeling and religious conviction; so that, whatever it may be safe for us to think,—for us who have had great advantages, and have been brought up in such a way that a certain moral direction has been given to our character,—I do not know what would become of the less favored classes of mankind if they undertook to play the same game. I wished only to enter the protest of one in whose veins runs the blood of Calvinistic ancestors, against the way in which Calvinism has been spoken of, and also to remind one of the speakers that the saint whom he quoted was the same who said, 'The greatest of these is charity.' Whatever defects and imperfections may attach to a few points of the doctrinal system of Calvin,—the bulk of which was simply what all Christians believe,—it will be found that Calvinism, or any other ism which claims an open Bible and proclaims a crucified and risen Christ, is infinitely preferable to any form of polite and polished skepticism, which gathers as its votaries the degenerate sons of heroic ancestors, who, having been trained in a society, and educated in schools, the foundations of which were laid by men of faith and piety, now turn and kick down the ladder by which they have climbed up, and persuade men to live without God, and leave them to die without hope. The worst kind of religion is no religion at all; and these men, living in ease and luxury, indulging themselves in the 'amusement of going without religion,' may be thankful that they live in lands where the gospel they neglect has tamed the beastliness and ferocity of the men who, but for Christianity, might long ago have eaten their carcasses like the South

Sea Islanders, or cut off their heads and tanned their hides like the monsters of the French Revolution.

"When the microscopic search of skepticism, which has hunted the heavens and sounded the seas to disprove the existence of a Creator, has turned its attention to human society, and has found a place on this planet ten miles square where a decent man can live in decency, comfort, and security, supporting and educating his children unspoiled and unpolluted; a place where age is reverenced, infancy protected, manhood respected, womanhood honored, and human life held in due regard,—when skeptics can find such a place ten miles square on this globe, where the gospel of Christ has not gone and cleared the way, and laid the foundations, and made decency and security possible, it will then be in order for the skeptical *literati* to move thither, and there ventilate their views. But so long as these very men are dependent upon the religion which they discard for every privilege they enjoy, they may well hesitate a little before they seek to rob the Christian of his hope and humanity of its faith in that Saviour who alone has given to man that hope of eternal life which makes life tolerable and society possible, and robs death of its terrors and the grave of its gloom."

Skepticism not Safe.—Mr. Lowell well remarked, "I think it not safe," referring to the position held by the skeptics to whom he was replying. Is skepticism safe for any one? Is it safe for a young man starting out to fight the battles of life? Can he afford to get along without the aid of a religion which can do him no possible harm, and which has evidently been a prop and a stay to thousands, and a source of comfort of inestimable

value? Think for a moment, young man, what will be your condition if in the end it should prove that your unbelief was a delusion, and that in rejecting the claims of Christianity and religion, you have rejected the only means by which you can be rescued from the thralldom of sin, and secure participation in a life beyond the grave. Suppose, on the other hand, it should prove that the Christian is mistaken. What harm can come to him? His religion has been all his life a comfort to him, and he has lived a better life, a purer life, and really a more successful life than he could have lived without it. If there is no life beyond the grave, he has lost nothing by his belief in it. The risk is all on one side.

Neglecting all considerations but those pertaining to the present life, is it not evident that every young man who would make a true success of life, needs, first of all, the guiding, strengthening, subduing, and controlling influence of religion? Man is a curious compound. He has in him qualities which ally him to the divine and pure beings of another world, linked with gross animal qualities which he shares in common with the brutes. In other words, every man has within him a beast, with appetites and passions which clamor for gratification. A good part of the battle of life, with a man who fights truly and manfully, is to subdue the beast within him, which, when once it rises to the mastery, seizes upon the intelligence, smothers the moral faculties, and makes of the man, once an image of his divine Creator, a veritable fiend, more grossly brutish than the most savage beast that prowls the earth. With a nature full of inherited tendencies to vice and grossness, surrounded by

temptations and incitements to evil on every hand, how can a man, even though his impulses may be good, contend single-handed against such fearful odds? Religion affords a means by which the beasts of appetite and passion may be subdued and chained—yea, even slain; and most unwise is he who, in his vain self-sufficiency, rejects this most essential of all aids, religion.

Influence of Habit.—The brain and nerves are so curiously fashioned that any act repeated many times comes at last to be performed with such ease and readiness that it is done with little or no voluntary effort. Such an act is said to be habitual, and may in time come to be performed quite unconsciously. In the formation of habits, the structure of the brain is actually modified in such a way as to enable certain acts to be performed much more easily than others. This explains why it is so difficult for habits to be broken, and why it sometimes seems absolutely impossible for the unfortunate victim of some wretched vice to free himself from a thing which, in his better moments, he thoroughly abhors. For such as these, particularly, religion affords a means of aid invaluable. But even with all the aids to be afforded by this and every other means, the battle for victory over habits long indulged is sometimes a most terrific one. Hence the importance of forming in early youth such habits as will not need to be broken. The world is full of people whose usefulness is nearly or quite destroyed by unfortunate habits contracted during youth. Let the young man who aspires to a noble and useful manhood, watch carefully over himself during his early years, when the foundations of his character, which will influence his whole life, are being laid.

Ethics of Health Caring.—"But," says a young man who recognizes the importance of holding fast to the principles of morality, as related to other matters, "is it anybody's business what I eat or drink or wear, or how I use my body? Do not I belong to myself? and have n't I a right to do as I please with myself?" These and similar remarks are very frequently heard by those who urge the moral obligation of health culture, and apparently in full sincerity on the part of those who make them, and with entire confidence that they are offering an unanswerable argument in support of their personal rights to do as they please respecting their own bodies, whether their actions are in harmony with the laws of health or not.

Let us see how much truth there is in the claim that individual rights include the right to treat the body in a manner not consistent with its interests,—to abuse the stomach for the purpose of affording the palate a questionable gratification; to whip and goad the brain and nerves by stimulants to do more work than is possible for them to do without injury; to recklessly violate any or all of the laws of health.

Individual Rights.—The claim is not that disregard of the laws of health does not injure the body, but that a man has a right to abuse his body if he chooses. Let us see. Here is a man who has vast possessions,—houses, barns, well-filled granaries, collections of rare and curious natural objects, galleries filled with beautiful works of art, safes filled with paying stocks and government securities,—all sorts of wealth. Suppose this man takes it into his head to destroy this wealth. Possessed by this idea, he sets fire to his houses and barns and

granaries, and into the flames hurls the contents of his costly collections; deliberately enters his art galleries, and demolishes the masterpieces of great artists which adorn the walls; opens the doors of his safes and vaults, and one by one commits his treasures to the flames. Hold on there! says the Law, and its strong hand is laid upon him as soon as his purpose is discovered. A man who thus recklessly destroys his property is regarded as either a criminal or a lunatic, and, in either case, unfit to be at large. The State recognizes the fact that the man's property is not wholly his own, or at least that others have interests in it. What he does not require for his own use, belongs to his children or other surviving relatives; or, in case he dies without a will and without heirs, to the State.

The State recognizes the right of a child to inherit from his father his due share of the property which the latter may have acquired. Ought not intelligent men and women to recognize the fact that the child has an even greater right to inherit from its parents a constitution unimpaired by vicious or injurious habits or neglect of the requirements of physical law? What can any parent possess which the child may inherit, that can be estimated as of greater value than a sound constitution, and vitality unimpaired by disease induced by excesses or by disregard of the wants of the body? If the rights of a child to inherit a fair share of the material wealth of its parents are considered worthy of respect and attention, are not its rights to inherit a sound and healthy body equally worthy of consideration?

Human Omnibuses.—The man who injures his constitution by reckless disregard of health laws, not only

impairs his own usefulness and real happiness, shortening his life, and bringing upon himself disease in various forms with all its attendant sufferings and inconveniences, but entails upon his children and his children's children, as well as all succeeding generations, the same diseases or tendencies thereto, and the same curtailment of life and happiness which he himself suffers. Indeed, the results of his follies may be felt even more keenly by his children and grandchildren than by himself. That quaint philosopher, Dr. Oliver Wendell Holmes, remarks that each one of us is an omnibus, in which ride all our ancestors. What right has any man by reckless habits of life to compel each of his children to carry about in his "omnibus" the results of the selfish gratification of depraved tastes and morbid appetites?

A Live Picture Gallery.—It may be said, and there is no exaggeration in the figure, that each man is a picture gallery, in which hangs the portrait of each of his predecessors; and among the pictures which hang upon the walls, may be seen some brilliant with beauty, others hideous with deformity; some beaming with health and vigor, others scarred and wasted by disease. Let every man who thinks he has a right to treat his body as he pleases, consider for a moment the fact that his portrait may sometime hang in somebody's picture gallery, drawn true to nature by an artist who never glosses over defects, or embellishes deficiencies. It is a matter of no small consequence to the owner of said gallery whether the picture which hangs there represents disease and decrepitude, or vigorous vitality.

In the grand palace of an Eastern prince stands the masterpiece of one of the greatest sculptors that ever

lived. The grace and symmetry of form and pose give to the white marble a startling appearance of life. The delicate beauty of the artist's conception, and the accuracy of the execution, are beyond description. A reckless vandal sees the treasure, and deliberately proceeds to deface it, until no trace of its former beauty exists. We look upon such an act with horror akin to that excited by murder or sacrilege. The human body is the masterpiece of the divine Architect. How dare any man say he may deface and destroy it if he choose!

The highest type of morality requires obedience to all laws, ready recognition and acquiescence to their requirements, and sturdy adherence to the right because it is right. The highest type of Christian will include in his creed the religion of the body as well as that of the mind and heart, and should accept for his rule of action a decalogue which recognizes every law essential to the physical and mental as well as the moral welfare of a human being.

Mind and Body.—Another consideration, which certainly is worthy of the thought of every young man, is the fact that the brain which does his thinking is a part of his body, and that whatever seriously affects his physical health, whatever lowers nerve or vital tone, directly affects, in a harmful way, his mind. The man whose vital tone is lowered by sedentary occupation, by dissipation, by any means which overtaxes or exhausts the nervous system, is in a condition of lowered nerve tone, which means lowered brain tone, lowered mental tone, and *lowered moral* tone. In such a condition of the body, acts which under other circumstances would be looked upon with horror, lose

their ghastly loathsomeness, and may at first be tolerated—afterward indulged. A man who is worn out and exhausted physically, cannot possibly appreciate with proper clearness and acuteness the bearing and relations of moral principles, as he can when refreshed by rest and recuperation. When one is exhausted and fatigued, the keen sense of propriety is lessened. Moral sensibilities previously acute are benumbed, and he is readily captured in the net which fortuitous circumstances or designing slaves to vice or crime may weave about him.

Thus it appears that health has a very important relation to morality, using the word in its common and narrow sense, and that no man who desires to live a pure and upright life can afford to run the risk of lessening his moral tone and his power of resistance to evil by impairment of his physical and mental vigor.

Millions in It.—Futhermore, it is the duty of every human being to make the very most of himself, and nothing is more important to a young man preparing himself for his life-work, than that he should make the most of his life, by preserving the highest possible degree of health. There are millions in it,—millions of happiness, usefulness, even of wealth. A man without health, even if his burglar-proof safe contains the wealth of a Rothschild or a Vanderbilt, is poorer than the ragged news-boy whose clarion voice resounds with robust health, and whose rosy cheeks tell of the richness of the vital fluid in his veins; or the Italian peasant boy whose daily toil gives him a vigorous appetite for the handful of chestnuts upon which he dines.

The millionaire is rich in cash, but often poor in comfort. He has a heavy pocket-book, and a heavier heart; a table spread with costly dainties, but no appetite; a palatial abode, and a pain-racked body in it. The hydra-headed monster, dyspepsia, glares at him from every savory viand at the dinner table. When he ventures out to walk over his domains, a vexatious rheumatism causes him to make wry faces at every step. If in his magnificent turn-out he seeks invigoration in the morning air, a veritable fiend, which the doctors have named *tic-douloureux*, drives him back to his overheated chamber, writhing with pain. When he lies down upon his luxurious couch, he sleeps not the sleep of health and physical soundness, but rolls and tosses restlessly about until a horrid nightmare settles down upon him, and holds him in its deathly grip. The glorious morning sun beams not with joy and gladness upon such an one. He rises languidly from his couch of torture, and begins another wretched day. The wood-chopper, with his brawny arm, his magnificent digestion, his sound rest, his ignorance of "nerves," nightmares, and neuralgias, is the envy of the millionaire, and justly so; he is the richer man of the two. The one has golden wealth, the other glorious health, and finds millions in it, though his pocket-book is thin, and his bill of fare a crust.

Social Ethics.

AMONG the obligations which human beings owe to each other, are courtesy and agreeableness. The man who robs his friends of the pleasure which they might derive from intercourse with him, by a coarse and brutish or otherwise disagreeable manner, is virtually a thief, for he deprives his associates of that to which they are rightfully entitled. We have elsewhere spoken of the value of courtesy as an aid to success, and need not here repeat what we have there said upon this point; and recognizing the fact that one of the essential requirements for agreeableness of manner in social intercourse is a knowledge of the customs and usages of good society, we append a few of the most essential rules of etiquette by which boys and young men should be governed in social intercourse among themselves and in polite society :—

Introductions. — In matters of introduction, the proper form is to present the gentleman to the lady, a younger to an elder person, an inferior in social standing to a superior. It is the place of the person thus presented to open the conversation.

A slight bow is all the salutation which courtesy

requires after an introduction. Shaking hands is optional, and it should rest with the one to whom the party is introduced to make the first advances. Shaking hands evinces greater cordiality and friendliness than a simple bow.

If several persons are to be presented to an individual, the name of the single party should be mentioned first, and the others enumerated in succession, each bowing slightly as his name is pronounced.

If an individual is to be presented to a company, an announcement of the party's name, and his title if he is a professional man or an official, is all that is required.

Friendly letters of introduction should be given only to intimate friends, introducing them to persons with whom the writer is also well acquainted. Letters of introduction to business or professional men should likewise be given only to and for parties well known to the writer, and even in these cases, only when the writer is perfectly satisfied that an acquaintance will be mutually agreeable or profitable to both parties.

FORM OF LETTER INTRODUCING A PERSONAL FRIEND.

J. H. Hooker, Esq.

Dear Friend,—This note will introduce to you Hon. Thomas Jones, a very particular friend of mine, who desires to meet you. Trusting the acquaintance will be mutually agreeable, I remain, as ever,

Your friend,

William James.

FORM OF LETTER INTRODUCING A BUSINESS ACQUAINTANCE.

Messrs. Halloway & Co.

Gents.,—I take pleasure in introducing to you Mr. Timothy Smith of this city, who visits New York for the purpose of purchasing goods in your line, and by my suggestion will call upon you. Mr. S. enjoys in this community the reputation of being a reliable and honorable business man, as well as a good citizen and a pleasant acquaintance.

Very respectfully yours,

John Richards.

Letters of introduction to and from business men may be delivered by the person introduced, and etiquette does not require the receiver to entertain the bearer as a guest or friend, though common courtesy will naturally suggest that such kind attentions as are practicable be shown him.

Letters of introduction of a friendly character should be sent to the person to whom they are directed, with the bearer's card and address. If the person receiving the letter feels favorable toward forming the acquaintance, he will call upon the party introduced in person, or by note acknowledge the receipt of the letter with an invitation to call; or he may simply send his own card, when the bearer of the letter of introduction is at liberty to call upon him.

Upon the Streets.—An inclination of the head, a gesture of the hand, or mere touching of the hat is a sufficient salutation between gentlemen meeting upon

the street. A gentleman in saluting a lady, or an elderly or superior gentleman, should raise the hat completely from the head

A gentleman walking with a lady should bow to those who recognize her, even though he be unacquainted with them, thus showing respect for them out of respect for his companion.

Always bow to an acquaintance when meeting upon the street. It is a mark of ill-breeding to pass a friend unrecognized, and it is civility to return a bow, even if you do not recognize the person. He may be some one whom you have met and forgotten.

In bowing, it is not necessary to bend the body, simply an inclination of the head is sufficient. The recognition should be respectful, familiar, or cordial, according to circumstances, but never accompanied by a broad smile.

A gentleman walking with a lady should treat her with the utmost deference. He may take either side of the walk, the lady always being given the side least exposed to inconvenience, crowding, or danger. He should offer to carry any parcel she may have, and should adapt his pace to her pleasure. In a crowd, the gentleman should always precede the lady. Two gentlemen accompanying the same lady should allow her to walk between them.

It is not customary for a gentleman to offer a lady his arm except when walking in the evening or upon an occasion when her safety, comfort, or convenience seems to demand it.

A gentleman should not join a lady acquaintance upon the street for the purpose of walking with her,

without first ascertaining whether his company would be perfectly agreeable to her. A gentleman wishing to converse with a lady whom he meets upon the street, should not stop her, but turn and walk with her until he has said what he wished, and should then, lifting his hat, bow and leave her.

On entering or leaving a store, house, or room with a lady, the gentleman should hold the door open and allow her to pass through first. A gentleman meeting a lady in a door-way, should stand aside, lift his hat, and wait for her to pass; or if the door be closed, should open it, and hold it open until she has passed.

Do not shout across the street to an acquaintance. All loud talking, laughing, or staring upon the street or in public places is decidedly vulgar. *Gentlemen* do not stand upon street corners, or lounge about hotels and stores, and talk about and stare at ladies as they pass.

To eat fruit, nuts, confectionery, or anything else on the streets, is not in good taste.

Looking back, after one has passed a person or an object, is not considered proper, unless the occasion be an extraordinary one.

Calls.—In making a short formal or business call, a gentleman should carry his hat and gloves, which are considered part of his toilet, in his left hand, but should not place them on the chairs or parlor table. If found necessary for some cause to use both hands, the hat should be placed upon the floor beside his chair. Umbrellas should be left in the hall or at the door.

In making informal calls or visits, the hat, gloves, cane, and overcoat should be left in the hall.

An informal call may be at least fifteen minutes long, but should not be so long as to be tedious.

Upon entering a drawing-room where a number of people are present, a person should bow slightly, as a general salutation before speaking to any one.

Choose a time to withdraw when there is a lull in the conversation; and after taking leave of the hostess, bow to those in the room, not separately, but to all at once.

Upon rising to take leave, go at once, do not start and then linger.

Never call upon a professional man or woman in office hours except on business, and always make the interview as brief as consistent.

In calling upon parties living in a hotel or boarding-house, it is customary to wait in the general parlor, and send up your card to the room of the person on whom you have intended to call.

Always be punctual in keeping an engagement. One has no right to waste the time of others by keeping them waiting.

Do not ask the price of any article you may observe belonging to another, except from intimate friends, and then only by asking permission to do so.

Do not walk about a room while waiting for your host, examining pictures, handling articles about the room, or striking upon the keys of an open piano.

Conversation.—Do not intrude business or professional matters into general conversation unless questioned by those participating. Long and heated discussions should always be avoided.

In conversation, aim to acquire the habit of talking sensibly and with facility on all subjects of general interest; and when in company with others, let the

topics brought up be those in which all are interested.

Avoid, especially, all gossip and scandal.

Neither correct nor appear to notice an error in pronunciation or grammar made by a person with whom you are conversing.

Do not try to force yourself into the confidence of others, nor pry into their private affairs by questioning; but if they give their confidence, never betray it.

Do not feel it incumbent upon yourself to carry your point in conversation; and when avoidable, do not discuss topics which arouse feeling and heated argument.

Never parade your accomplishments, nor affect superiority in any particular. In the company of an inferior, never endeavor by your conversation or manners to cause him to feel other than your equal.

In your conversation and conduct, adapt yourself so far as possible to the persons in whose company you chance to be (providing, of course, that you do not choose to throw yourself into low or disreputable company). Make it a rule to study the pleasure of those you are with, and listen to and talk about the subjects of conversation which most interest them.

Never attract attention to yourself by loud talking or a dictatorial manner. Allude to personal affairs as little as possible, and do not parade the fact that your friends or family may be wealthy, of noble birth, or possessed of any superior advantages.

Never answer another curtly or impatiently, and never hesitate to offer an apology at once when one is due.

Do not monopolize the conversation, nor engage in a

whispered or private conference in the presence of others, or converse in a foreign language not known to all present.

Never ridicule others, nor seem to notice by word or look any peculiarity of dress or person of another.

Do not read newspapers, books, or letters in company. If necessary to do so, beg to be excused.

Avoid all slang. Do not laugh at your own wit.

Avoid mimicry.

Do not interrupt another while speaking.

At Table.—Never lean upon the table with the elbow, or drum with the fingers, and do not toy with knife, fork, or spoon. Never make use of a napkin in place of a handkerchief, for wiping the face or nose.

It is considered contrary to etiquette to shovel one's food into the mouth with a knife. Everything that can be eaten with a fork should be taken with that utensil alone. If necessary to use a knife, use it only for dividing the food, and convey it to the mouth with a fork.

Bread should be broken, not cut. Use a spoon for soup and puddings. In eating large fruits, like apples and pears, divide the fruit with a knife, partaking of it in small portions.

Keep the mouth closed while masticating food. Both eating and drinking should be performed slowly and noiselessly.

If a plate be handed you at table, always retain it unless asked to pass it to your neighbor. It is to be supposed that the host knows whom he desires to serve first, and to pass the plate is considered a reproof upon his selection. If a dish is passed you, serve yourself if desiring any, and then pass it on.

The napkin should be placed across the knee, and not hung about the neck like a bib.

Never reach across your neighbor's plate for a spoon or other articles, but ask him to pass them to you.

Do not take salt or bits of sugar from the bowl with the fingers, or help yourself to butter or other food with the knife or fork you have been using.

Never pick the teeth at table. If such a thing be absolutely necessary for comfort, do it behind a napkin. Avoid sneezing, coughing, and expectorating if possible.

A gentleman attending upon a lady at a dinner party will see that she is helped to all she wishes, with as little trouble to herself as possible.

Do not find fault with the food; and if by chance anything unpleasant is found in it, the attention of others should not be called to it either by remark or manner, even though one's own appetite be spoiled.

Eat moderately, never fast, and never put large pieces of food into the mouth, as this is an evidence of greediness.

Do not crumble bread or other food about your plate, and strive to keep the cloth as clean as possible.

All beverages should be sipped from the cup or glass, but without noise.

Never tilt back in your chair, nor sit too far from the table.

Having finished the meal, if at home, fold your napkin, when done, and place it in your ring. If at a hotel or away from home, leave the napkin unfolded by your plate.

Do not leave the table before the rest of the family without begging leave, except at a hotel or boarding-house.

Do not scrape your plate for the last atom of food,

nor tilt your sauce dish and turn out the last drop of juice into your spoon; and do not help yourself to an unusual quantity of any single article.

General Rules of Conduct.—The same respectful deference due from a gentleman to a lady should at all times be shown by a younger to an elderly gentleman.

When in the company of others, every action should be marked with respect for those present.

Nothing can be more adverse to good manners than sitting with the hat on in the house, lounging upon the chairs, tipping them back on two legs, yawning and whispering in company, sitting cross-legged and hugging one's knee or foot, fumbling with the watch chain, biting or tearing the nails, taking the best seats in the room and keeping them when ladies or elderly people enter, standing between others and the fire, spitting into the fire, and various similar practices which are generally conceded to be characteristic of the free and easy way of the American people.

Coughing, sneezing, clearing one's throat, scratching the head, picking the teeth, cleaning the nails, etc., should be avoided in company. Never fidget. If you are bored by the uninteresting conversation or lengthy speech of another, do not allow it to be apparent by any visible sign of uneasiness.

Avoid loud talking and gesticulation. If necessary to indicate an object, do so by a slight movement of the whole hand or head, but never point with the finger.

Neatness of attire and cleanliness of person are especially essential, if we desire to be considered agreeable in society. A person may have any amount of goodness and ability; but if his appearance bespeaks

the sloven, his presence will not be desirable to persons of refinement. Especial care should be taken of the hands. They may be stained and roughened by honest toil; don't be ashamed of that, but take off all that soap, warm water, and a good nail-brush will remove.

Never exhibit the weakness of supposing that people of refinement will find your presence welcome or desirable if your hair and clothing are saturated with the filthy odors of spoiled hair-oil and perfumery, to say nothing of tobacco, cigars, and alcohol, or a neglected skin.

If one would be polite in public, he must be so at all times and with all persons. The man who is uncivil to a washer-woman or kitchen maid, will be in great danger of being impolite to those whose good opinion he desires to possess.

Do not speak of persons outside the family circle by their Christian names, nor address them by such when in the company of others.

In addressing persons, avoid undue familiarity, such as the use of nick-names, patting a person upon the back, etc., remembering the familiar rhyme,—

> "The man who calls you Tom or Jack,
> And proves by thumping on your back," etc.

Treat the religious beliefs of others with the utmost respect; and in talking upon religious topics, avoid cant and exhibitions of bigotry.

Always hand a chair for a lady, pick up any article she may have dropped, and do any other little service she may seem to require, but do not press attention upon her.

If differing from another in opinion, do not directly contradict him, but courteously beg pardon, and say, "I think you have been misinformed," or "are mistaken," or in some like phrase modify the bluntness of a contradiction.

Gentlemen should always precede ladies in entering a church or other audience room.

The basis of all true politeness is the Golden Rule, "Whatsoever ye would that men should do to you, do ye even so to them."

A French writer has said, "To be truly polite, it is necessary to be at the same time good, just, and generous."

No true gentleman will use tobacco in any form, or indulge in alcoholic drinks under any circumstances. The use of these poisons is inconsistent with real gentility, and benumbs the finer sensibilities of those addicted to them.

Special Rules for Boys.—Always remove the hat upon entering a house.

Never enter a private room or the room of a guest without knocking.

Always offer your own seat to persons entering a room, and never keep a seat, either in a house, church, or public conveyance, when a lady or an elderly gentleman is standing.

Never slam doors. Do not run up and down stairs. Do not slide down the banisters. Step lightly, quickly, and orderly at all times within doors.

Never be rude or boisterous to your sisters or playmates. Avoid loud shouting and rude merriment; never indulge in slang phrases, and never jostle nor push in a crowd.

Always clean the boots or shoes well before entering a house or school-room.

Never throw hat, coat, boots, or school-books about the room for mother or sisters to take care of; but have a place for everything, and keep everything in its place.

Never go to the table or sit down in the presence of ladies with unkempt hair, soiled clothing, or muddy shoes.

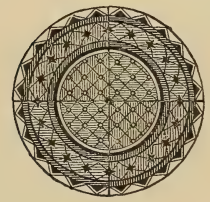
Always show as much deference at all times for mother and sisters as for any other ladies.

Never elevate the feet upon tables, cushions, sofas, or chair backs.

Never laugh at or ridicule a person in any way because of patched clothing, deformity of person, or peculiarity of any sort.

Never stare at people, and never interrupt when another is speaking.

Never try to appear clownish, nor use vulgar, indecent language.



Getting a Wife.

THIS is a question in which most young men sooner or later become interested, and which is worthy of the most careful and candid consideration. The formation of a partnership for life is a transaction of no small importance, and demands cool, deliberate judgment, and the careful weighing of numerous considerations, rather than rash obedience to the dictates of a blind and impetuous passion. Marriage is an institution which involves in the most important manner all the relations of life, physical, mental, moral, and social. The brief space which we have to devote to the subject compels us to confine our considerations chiefly to its physical relations.

Relation of Marriage to Health.—It is clearly shown by the statistics of various countries, that married persons of both sexes enjoy longer life than single persons do. This is probably due, in the case of males, to the greater regularity of life and freedom from those disorders which are the penalty of those profligate habits to which a large proportion of single men are addicted. In the case of women, who incur greater risks in the marriage state than men, the longer life is probably due to the relief from mental strain and worry which most

women experience, especially in later years, though it must be admitted that quite too large a proportion of married women do not find in marriage that quietude and satisfaction which they have been led to expect. On the whole, however, there is no question that the tendency of marriage is to prolong life, and to conduce greatly to individual welfare and happiness when its ends are not perverted and its privileges abused.

Traces of the marriage institution are to be found in the social usages of all nations, even the most barbarous tribes exhibiting some knowledge of the advantages to be derived from the establishment of the family relation. One of the distinguishing features of nations of the highest grade of civilization and intelligence is the high degree of regard in which the marriage institution is held. When a nation begins to deteriorate, one of the first symptoms of social degradation is neglect and disregard of marriage obligations. The growing infrequency of marriage in this and some other civilized countries, and the increasing multiplicity of divorce cases which crowd the courts, especially in some parts of the United States, are evidences of disease in the social and moral life of nations, which demand the earnest attention of all workers for the good of humanity.

The Object of Marriage.—The primary object of a union of the sexes is the propagation of the species. Marriage, however, involves much more than this. It is an institution peculiar to humanity, and, in its highest form, is characteristic of the most enlightened grade of humanity. It involves a union of other and far higher than mere sensual interests,—a union by which both of the contracting parties retain their individuality and all

their individual rights, notwithstanding the community of aims and purposes which characterize a genuine matrimonial alliance.

Men sometimes view their wives very much as they do fine houses, lands, horses, or other valuable possessions. It is needless to remark on the gross selfishness of this view of marriage. The natural, inalienable rights of every human being render it impossible for any one to become proprietor over another. There is no rite or ceremony, no law, human or divine, by which the natural rights of a woman may be abrogated in favor of a man. It is important in the interest of men as well as women that men should consider this fact, and grant to their wives as great liberty of conduct, opinion, and conscience as they themselves claim.

A man who looks upon his wife as a mere chattel, or simply as a means of sensual gratification, entertains too base a view of marriage to be worthy of any woman, unless she is as gross and sensual as himself. While marriage gives opportunity for unbridled gratification of the animal instincts, morality and the recognition of the physiological objects of marriage, restrict such gratifications within very narrow limits. The man who most thoroughly appreciates and enjoys the marriage relation, is he who restrains and controls the animal passions within the limits of physiological law.

Who Have no Right to Marry?—The idea that every man has a right to marry any woman who chooses to accept him as a husband, is a mistaken one. Two parties are mutually interested in the marriage relation, and each has rights which must be considered. It is evident that all men are not prepared to become desir-

able husbands. This may be due to inherited or acquired defects and diseases, or to the possession of various other undesirable qualities. The man who marries, expects, at least, to obtain a woman who will be a desirable wife, and if disappointed, considers some one blame-worthy. A woman, in marrying, has an equal right to expect in a man desirable qualities as a husband. We do not say that a man, to be fit to marry, must be possessed of the highest grade of qualification; but he ought, at least, to possess merits sufficient to be worth marrying. There is still another party whose interests must be considered, namely, the offspring. Under ordinary circumstances, a man who is incapable of begetting healthy children, ought not to marry. The world is full of the offspring of worthless fathers, and it is high time that the obligation of parents to beget healthy children was recognized as a moral duty, and the voluntary begetting of children infirm in body and mind, as a crime against humanity and civilization. But let us notice a little more particularly the qualifications of those who have no right to marry.

Boys Should not Marry.—Though the laws of nations differ much respecting the age at which marriage is permissible, anatomy and physiology most emphatically assert that persons who have not attained complete physical development have no right to marry. The law of heredity stamps upon the offspring the image of the parent. If the father has not yet attained maturity, in other words, if he is still a boy in mind and body, his boyishness will be indelibly stamped upon his child. This fact undoubtedly accounts for at least a great number of individuals, who, though old in years, exhibit

such puerilities of character as to completely negative, in their cases as least, the adage, "Gray hairs bring wisdom." A man who wishes to obtain a vigorous and hardy horse, would certainly not select one that he knew had been sired by a colt. Boys who contemplate marriage, ought to know that the same laws which govern the propagation of other members of the animal kingdom, hold good respecting the propagation of the human species as well, and should consider seriously whether the sons and daughters of a boy-father will be a valuable addition to the human race.

When to Marry.—The age at which it is proper for a man to marry is indicated by that at which he attains maturity, which is about twenty-five years. Prior to this age, he is really a boy; his bones have not yet completed their development; the character is not yet completely formed through the development of the mental faculties, and the whole body is immature. Among certain ancient nations, marriage was not permitted until some years later than the age named; and it must be admitted that the people among whom this practice prevailed, attained a higher degree of physical development than any nation known to ancient or modern times.

Old Men Ought not to Marry.—Perhaps this statement is a little too sweeping, but all intelligent persons who have had opportunity for observing the results of marriage in old men, will testify that in nine cases out of ten they are anything but desirable. This is especially liable to be the case when the old man marries a woman much younger than himself. Nothing is more obnoxious to good sense, and we might perhaps say morality, than the union of an old man just entering

upon his second childhood with a young and blooming girl. Such a matrimonial alliance means, in most cases, speedy death for the one, and infinite misery for both. If the old man must marry, let him take a wife about his own age, who is prepared to lead a calm, quiet life, which is natural to the aged as well as essential for their physical, mental, and moral welfare. The old man who contemplates taking a young girl for a wife, should reflect that such an action is contrary to natural instincts, and that it is likely to be prompted by animal desires which, for his mental happiness and his physical and moral safety, should have been long ago extinguished. On the other hand, the young lady has probably been led to consent to such an unnatural union by the allurements of wealth, social position, or some other motive foreign to that real affection which constitutes the basis of true marriage. The relation which such a woman sustains to her legal husband in the eyes of natural, and, we may almost say, moral law, is that of a mistress rather than that of a wife. The old man who values his peace of mind, and who would avoid the unhappy fate of him whose gray hairs go down in sorrow to the grave, will wean himself from the extravagant, and, for him, dangerous excitements of love, and content himself with those mild and quiet enjoyments, which, while less fascinating and intense in character, are vastly more enduring, and, in the end, afford greater satisfaction.

A Worthless Man Should not Marry.—A man who "is good for nothing," who is unable to add anything to the world's store of knowledge or wealth, or to contribute to the happiness of his fellow-beings, who is slovenly, debased, groveling, shiftless,—such a man not

only has no right to marry, but commits a crime in doing so. What must be the lot of the wife of such a husband! The woman who has been betrayed into marrying such a man, is condemned to a life the most wretched imaginable. Some such women we have seen,—women who, under favorable circumstances, might have been lights to society, who might have wielded a mighty influence in the elevation of their fellow-men, but who were bound hand and foot by the cruel ties of an unfortunate marriage, chained to a worthless clod who is incapable of usefulness himself, and a most efficient hinderance to the usefulness of others.

The man who contemplates marriage and wishes to marry a good and worthy woman, should consider, first, whether he is himself worth marrying; and if a candid introspection convinces him that he is not worthy of such a wife as he desires to marry, let him at once begin such a work of self-culture and discipline as will elevate him to the standard by which he would measure the woman he desires to win.

A Wicked Man Should not Marry.—Recent investigations respecting the causes of crime have revealed the fact that the disposition to crime, as well as other mental and physical qualities, is hereditary. A man who is a thief, a robber, or a murderer, begets children with the same evil propensities. The intermarriage of wicked and vicious persons has resulted in the production of what is known in every country as "the criminal classes." Through this means, notwithstanding the continued efforts of "reform schools," "homes," "asylums," and a great number of other reformatory enterprises, crime is continually increasing, and in a

ratio far greater than the growth of the entire population. Something ought to be done to check this propagation of vice, this most efficient means of recruiting the class of men and women who oscillate between the brothel and the almshouse, the gutter and the prison. The marriage of such persons ought to be prohibited by law. It certainly ought to be discountenanced by society. The clergyman or the justice of the peace who knowingly performs a marriage ceremony by which a wicked man is made a husband and a possible father, does a wrong to society, the commission of which ought to annul his authority to administer so important a rite.

Young men who have spoiled themselves by a career of vice or crime, are usually of all men most particular respecting the character of those whom they seek to marry, and are particularly fond of selecting for wives, young, pure, and unsophisticated girls, who know nothing of the evils or vices of the world. Sometimes such a union seems to result well enough, the influence of purity and virtue in the one predominating over the tendency to vice in the other; but this is by no means universally the case. If the young woman, once pure and good, is not contaminated by contact with one who is thoroughly defiled by sin, and gradually demoralized, her existence is one of perpetual wretchedness. Instead of those noble qualities of mind and heart which she might admire and respect, she finds only selfishness, sensuality, and moral rottenness.

Young women are not infrequently led to marry men whose characters are known to be bad, with the idea that they may reform them. Sometimes, indeed, this Herculean task may be accomplished; but quite too

frequently the reformation, even if apparently accomplished, is only transient, and the man who in the days of his courtship promised to be his wife's highest ideal of pure, noble manhood, lapses into the pit of moral corruption where the vile practices of years have dragged him. The young man who offers to a woman, as an inducement to marriage, the opportunity to reform him, is, in ninety-nine cases out of a hundred, a hypocrite of the deepest dye. A man who really wishes to reform, will reform himself; and until a thorough reformation has been effected, he has no more business to ask a pure woman to marry him than if he were suffering with the small-pox or the leprosy. The fact that there are women so unwise or so inexperienced as to be willing to accept such a man for a husband, does not remove the responsibility from the place where it belongs, on the shoulders of the man who has made himself, by his vices or his crimes, unfit and unworthy to be the husband of a good woman.

Epileptics Should not Marry.—There are few forms of nervous disorders more horrible in their agency, or more certainly destructive of the mind, than epilepsy; and to the terrible effects of this disorder upon the individual is added the almost mathematical certainty of its transmission through heredity. An epileptic father or mother begets insane or epileptic children. A person afflicted in this way for many years should abandon all thoughts of marriage, even though the disease may be temporarily stayed through the influence of powerful remedies. If the disease has occurred as the result of some injury to the nervous system after maturity has been attained, or has been produced by

functional disturbances of the stomach or liver, or from nervous exhaustion from some cause, and has been cured by the employment of the proper measures, the individual need not be forbidden to marry, provided the lapse of two or three years has proven the permanency of the cure; but when the disease is the result of heredity, or has existed since early childhood, the prospect of a permanent cure is exceedingly small, while the probability of transmission by heredity in case children are begotten, is almost a certainty.

Persons of Insane Temperaments Should not Marry.—Cases have undoubtedly occurred in which persons who were really insane have married and reared families, but there is probably no one who would defend the propriety of such a marriage. The children are apt to exemplify the old adage, "Like father, like son," and at an early age are found in our reform schools, prisons, or lunatic asylums. These cases are, however, not sufficiently common to be the source of any great amount of harm. The greatest danger lies in the propagation of a tendency to insanity through the marriage of persons possessing what is known as "the insane temperament." These individuals are generally found in families in which insanity has developed in one or more members. They are usually peculiar, crotchety, and eccentric. Familiarly known as "cranks," they are made the butt of ridicule. Their erratic utterances and conduct are laughed at by unthinking people, who consider them simply as amusing and peculiar people, entertaining no suspicion that in the crotchety brain of the crank lies the germ of that most terrible of all human maladies, insanity. The children of a crotchety

man are likely to be still more unbalanced than himself, and what is in the father simply an eccentricity, develops in the child into some one of the various forms of mania.

The young man who is aware of the fact that insanity is a prominent feature in his pedigree, and who has not the most indubitable evidence that his physical and mental characteristics follow the line of a healthy and well-balanced ancestor, rather than that of the mentally disordered one,—such a man commits a crime when he takes upon himself the responsibility of marrying and bringing into the world recruits for prisons and lunatic asylums.

Should Consumptives and Scrofulous Persons Marry?—The rapid increase of consumption, as indicated by the mortality from this disease, which constitutes nearly one-fifth the total number of deaths in old-settled countries, points unmistakably to the fact that some potent cause must be in operation, causing the propagation of this malady. The observations of scientific physicians have fully established the view that the tendency to consumption, as well as the disease itself, is hereditary, and the evidence that the same is true of scrofula is too strong to be doubted. When one considers the terrible ravages of these two constitutional maladies, can there be any doubt as to the impropriety of the marriage of those who have a clearly marked tendency to these diseases, at least unless such a tendency has been thoroughly extinguished by a careful regimen and a proper course of physical culture?

May Syphilitics Marry ?—The horrible hereditary effects of this frightful malady ought to be sufficient to deter any one in whose breast all sense of obligation to his fellow-men has not been obliterated by long years of slavery to vice and crime, from incurring the risk of inflicting such wretchedness and suffering as is almost certain to be experienced by his offspring. Certainly, no man who has suffered from syphilis has any right to offer himself in marriage to a woman who is not, like himself, contaminated by the physical and moral taint of this disease.

Innocent and unsuspecting women often suffer life-long injury through marrying men who by fast lives have acquired gonorrhœa, or gleet. This disease, sometimes even when apparently cured, or when existing in so slight a form as to be hardly noticeable in the man, may give rise to most painful and distressing disorders in a woman. We have met a number of cases in which women who, until the day of their marriage, had enjoyed perfect health, but since marriage had never been one day free from pain and suffering from this cause. The author holds that a man who has suffered from even the milder forms of venereal diseases, has no right to marry without acquainting his intended wife with the full facts as to his condition, and then not until several months have elapsed since he has been pronounced by a competent physician to be free from the last trace of the disease.

May a Drunkard Marry ?—The man who is a slave to drink has no right to ask any woman to share his shame, or to aid him in rearing children who are stamped at the moment of conception with a morbid craving for

alcoholic drinks. The man who is determined to destroy himself with drink, should be content to destroy himself alone, and not insist upon dragging others down to his own degraded level. Hundreds of thousands of women's lives have been wrecked by being beguiled into marrying young men addicted to drink, by the promise of reform upon condition of doing so. In by far the greater number of these cases, six months do not elapse after the ceremony before the young man returns to his cups, and the young woman is left to repent her folly during a life of wretchedness.

Should an Improvident Person Marry ?—Will any one question the assertion that a man who is not able, through mental or physical incompetency, to support a wife, has no right to marry? Thousands of young men rush blindly into matrimony without stopping to think of the ways and means by which a family is to be provided for, trusting to luck, or perhaps to the efforts of the wife, to provide bread for hungry mouths which they are themselves incompetent to feed. No young man has a right to marry until he has acquired a trade or a business which will insure at least a comfortable livelihood for those dependent upon him. The author is of the opinion that it would be wise if young men were required by clergymen and other parties authorized to administer the rite of marriage, to produce evidence of the ability to support a wife and family before the performance of the marriage ceremony.

Whom to Marry.—The young man who desires a wife will certainly not wish to select a young woman possessing any of the characteristics pointed out as undesirable in young men. As a rule, young men are

far more particular respecting the personal character of those whom they seek in marriage than are young women. Nevertheless, impetuous though worthy young men not infrequently commit serious blunders in the selection of a life partner; hence the following suggestions may prove serviceable:—

1. Be careful to become well acquainted with the young woman whom your fancy may have chosen, before asking her to become your wife. An acquaintance formed at a party, picnic, sociable, or during moonlight walks, or evening parlor chats, is of very little value in forming the basis for a proper estimate of character. Young ladies who are in search of husbands, naturally do their best to appear to good advantage, and are very likely to appear so if the thing is possible for them, when on exhibition, as on such occasions as those referred to. A thorough knowledge of a young lady's character will necessitate a thorough acquaintance with her conduct at home, her behavior toward her parents or brothers and sisters, her personal habits, etc. Is she respectful to her parents and thoughtful of their wishes? Is she kind and gentle in her behavior toward her associates? Does she respect religion, or is she irreverent and irreligious? Is she quiet or boisterous? Is she haughty and overbearing? Is she simple in her tastes, or does she love pomp, display, and excitement? Has she pure, refined, and womanly sentiments, or is she flashy and vulgar? Is she cheerful and happy in disposition, or gloomy and morose? Is she neat and tidy in personal appearance, or lax and careless? All these are questions, the answers to which decide whether your

married life is to be happy or wretched, peaceful and enjoyable, or in the highest degree infelicitous.

2. Do not marry a flirt. A young man who is seeking a wife should avoid, as he would a scorpion, the professional flirt. A woman who has made a pastime of breaking hearts, carries in her breast a heart as incapable of genuine love as the hardest rock. Do not waste any affection on such a woman, no matter how great her accomplishments, or how alluring her charms. If your feelings have become in the slightest degree entangled, make haste to effect your escape from the snare. Such a woman can no more make a happy home than she can fly. Her conscience is seared, her sensibilities blunted, her affections decayed. If you have been deceived by her, consider yourself fortunate in having escaped the greater calamity of marrying her.

3. Do not marry a woman of fashion. A woman whose life is devoted to following the ever-changing fashions of the day, has no room in her heart for domestic love, and no time to devote to the business of home-making. She may possess many excellent traits, and many admirable qualities, but she has been spoiled by erroneous education. She knows nothing of the simple arts by which a home is made comfortable and happy; and if you should be unable to supply all the demands of her morbid and artificial tastes, she will soon cease to love you altogether, and render your life wretched by her importunities or her reproaches.

4. Seek a healthy wife. In this degenerate age, among civilized nations at least, health, especially among women, has become an exception rather than a rule; and so long as men are willing to accept as wives pale,

puny creatures who, though very "interesting," are very helpless when brought face to face with the stern realities of life, women will continue to attach little importance to physical culture as a preparation for wifehood and motherhood; but if all the young men in the country insist that the young women whom they select as wives should possess good health, gymnasiums for young ladies will quickly start up in every corner of the land; piano thrumming, embroidery, daubing with water-colors, and sentimental poetizing will fall into disrepute; the homely art of housekeeping will supplant some of the so-called fine arts which are now cultivated so assiduously by persons who have really no more taste or natural genius in this direction than a backwoodsman or a blacksmith; and young women will become as proud of depth of chest, largeness of waist, and hardness of muscles, as they now are of their small arms, *petite* figures, and general helplessness.

A young woman who has emasculated her womanhood by tight-lacing and wearing French-heeled shoes, and who is given to fashionable dissipation, is no more fit to marry than she is to perform as an acrobat or a pugilist. No young man possessed of average good sense will marry a woman who has squeezed her liver out of shape, compressed her stomach out of place, and, to use a printer's phrase, made a "pi" generally of her "internal arrangements" by tight-lacing.

Don't Be in a Hurry.—When "head over heels in love," a young man is almost always in a desperate hurry to press his suit to a favorable culmination. Don't be too fast, young man. Wait a little while for the impetuosity of the first tender passion to wear off.

Then you can take a calmer view of the case, and will be better prepared to form a deliberate and correct judgment. Love at first sight is very apt to be as blind and unwise as it is impetuous. Keep fast hold upon your feelings, and wait until sure that you will not be making a terrible mistake in following your impulses. The love which is most enduring is not one which is simply a sentiment; but is the result of sentiment re-enforced by reason and judgment, deliberately exercised. Such a love does not wane with the honey-moon, but grows fuller, richer, and stronger with the lapse of years.

What about Temperaments?—Much has been said about the proper adaptation of temperaments in marriage. One recommends persons of like temperaments to marry; while another, who claims to be equally wise, declares that opposites constitute the proper combination. The only word we have to say on this point is that, irrespective of temperaments, persons should be congenial. It is folly to lay down rules by which people should "fall in love." Such rules would never be followed, and would be very likely to cause more mischief than good. People whose tastes are unlike, if possessed of real affection for each other, will naturally approximate their tastes until a happy and congenial mean has been reached. It is wise, perhaps, that those who are constitutionally feeble should seek to remedy the defect for their children by selecting a partner possessed of a high degree of physical vigor. By this means, marriage may become the means of improving the race. The intermarriage of feeble persons would naturally tend to deterioration.

Should Cousins Marry?—Experience indicates that

the children of cousins are far more likely than others to be afflicted with deafness, idiocy, and other physical and mental defects. This is particularly apt to be the case if both possess the characteristics of a common ancestor. In view of this fact, it is evident that cousins ought not to marry, certainly not unless there is evidence of the most positive character that they follow different ancestral lines.

Lastly, if you wish to obtain a good, pure, noble, lovable woman for a wife, be careful to make yourself a good, noble, lovable man. If you do this, you may be sure that sooner or later you will have the good fortune to meet the woman who will exactly embody your ideal of a wife, and who will recognize in you her ideal of a husband.

An Evil Heritage.

PHILOSOPHER has said, "To be well born is the greatest of human felicities." Unhappily for the human race, this good fortune comes to but a small proportion of the human family. Not every one is so unfortunate as poor "Pip," the hero of "Great Expectations," who said that he was always treated as if he "had insisted on being born in opposition to the dictates of reason, religion, and morality;" but certain it is that if reason, morality, and common sense were allowed to dictate the matter, many thousands of poor, wretched, unhappy human beings would never have been born at all. Thousands of miserable beings received from their parents a heritage of boundless wealth in the line of lands, houses, and bank accounts, but the direst poverty as regards that most valuable of all treasures, health. The child who inherits from its parents a frail and feeble constitution, incompetent to cope with the exigencies of life, without the physical vigor necessary to sustain the effort required to prepare for or to lead a life of usefulness, has an evil heritage for which no amount of money, "good name," or worldly wealth can possibly compensate. On the other hand, the man

who inherits from his parents a sound body and a large fund of vitality, may well consider his legacy a rich one, although he may be born in obscurity and left penniless.

We have spoken of a good constitution; let us consider for a moment what a constitution is. One man, we observe, is able to perform a great amount of labor, to endure hardships, to withstand the attacks of disease, and to live to a good old age in enjoyment of health and physical strength; while another man wilts under physical conditions far less adverse, like a delicate flower beneath the scorching rays of the sun. One has a good constitution; the other has a feeble one. The human body is in many respects much like a machine. Like a chain, its real strength is simply the strength of the weakest link; or, like a complicated apparatus, its actual strength is the strength of the tiniest wheel, or the most delicate pinion. A machine constructed with all its parts properly adapted to each other, none stronger and none weaker than they should be, each capable of doing its duty regularly and without undue friction,—such an apparatus may be considered as a machine with a good constitution. It will many times out-wear a poorly constructed or unbalanced machine, in which undue strain is allowed to fall upon parts not prepared to bear it safely.

How Constitutions are Ruined.—That a boy inherits from his parents peculiarities of temperament, complexion, expression of countenance, even peculiarities of gait, are matters of common observation. If a boy has an unusually large nose, a prominent chin, a special genius for music, poetry, or mathematics, we expect to find

the same characteristics in his parents or somewhere among his recent ancestors. No one questions that these physical and mental traits may be readily transmitted from parents to children. "Like father, like son," is a trite proverb which applies to grandfathers and great-grandfathers, grandsons and great-grandsons, as well as to fathers and sons. If external features are thus transmitted, who can doubt that the internal likeness between children and parents is equally as great? In other words, can it be questioned that a father transmits to his son his quality of lungs, liver, heart, brain, and nerve, as much as his external form?

A father once brought to us a son for medical examination. A moment's glance at the lad showed that he was a boy of feeble constitution. In reply to our question, "Was your son a healthy infant?" the father replied "No; he was such a puny baby we thought we could not raise him." And what wonder? The reeking fumes of tobacco plainly told that the father was a tobacco slave. The cigar or the quid was his constant companion during his waking hours. He said he was "tough as a knot." Never had a fit of sickness in his life. Could eat anything he liked, and usually did. Had smoked and chewed ever since he was a little boy, and "knew it did n't hurt him." It seemed to him very strange indeed that he should have for a son such a puny, dwarfed specimen as was the twelve-year-old lad whom he presented for examination. There are thousands of fathers who have just such sons, and thousands of sons who are so unfortunate as to have just such fathers.

Some years ago a man in the prime of life applied to us for an examination of his heart. Investigation showed

great irregularity. He complained of palpitation, sudden faintings, and other very serious symptoms, which indicated great weakness of the heart. An examination with the stethoscope fully confirmed the evidence of the pulse and other symptoms. It was evident that he was suffering from narcotism of the heart, the result of tobacco-using. When the true nature of the case was explained to the patient, he at once exclaimed, "How is it possible that the small amount of tobacco which I have used should affect me so seriously, when my father and mother both used tobacco all their lives, and it did n't hurt them? They are healthy old people now." Here was the secret. His father and mother had squandered their heart strength in tobacco-using, and the young man had inherited a weakness in this particular, which rendered it impossible for him to use the weed without speedily suffering serious consequences.

Some Bad Legacies.—The transmission from parents to children of actual disease is perhaps infrequent; but the transmission of constitutional weaknesses and tendencies to disease are exceedingly frequent. It may perhaps be questioned whether acquired morbid conditions are readily transmitted by heredity; but no one who has been a close observer of men from a medical standpoint will hesitate to accede to the affirmative view of the matter. If further evidence than that which is presented by common observation were needed, it is afforded by a curious experiment made some years ago by Dr. Browne-Sequard of Paris. This celebrated physiologist, in the course of a series of experiments upon guinea-pigs, found that by irritating a very small spot in the brain of the guinea-pig, a disease was pro-

duced which exactly corresponded to epilepsy in human beings. The general health of the animal did not seem to suffer greatly, but it became subject to those frightful convulsions which constitute the leading symptom of this most horrible of all nervous disorders.

Continuing his observations, Dr. Browne-Sequard discovered that the disease was transmitted to the offspring of the animals operated upon, proving beyond any possible question that an acquired disease or morbid condition may be transmitted from parents to children. Let us devote a little space to the consideration of some of these unfortunate inheritances.

Consumption.—That consumption runs in families is a fact familiar to all. One of the first questions asked the candidate for life insurance by the examining officer is, "Did your father or your mother die of consumption?" No insurance company considers it prudent to insure the life of a man whose father or mother or any other near relative died of this disease. A consumptive tendency is one of the worst of the physical legacies which a child can inherit from its parents. With such an heredity, a man has ever staring him in the face the prospect of an early death, of being cut down by the great destroyer just as he is prepared to engage actively in the earnest duties of life.

A tendency to consumption may be inherited from a father who was not himself a consumptive, and did not die of the disease. A man whose lungs are naturally strong and whose constitution is vigorous, by sedentary habits, by insufficient exercise, by confinement in poorly ventilated rooms, by a general neglect of the laws which govern healthy action of the lungs, may so weaken and

deteriorate these important vital organs that their inherited weakness may be transmitted to his children. Thus a disposition to lung diseases of various types may be originated.

Scrofula.—This hydra-headed malady, in many respects like consumption, is not only the result of direct transmission to children from diseased parents, but is frequently the result of other diseases which weaken the vitality of the parent, and produce constitutional feebleness.

Scrofula is not, as is supposed by many, a disease of the blood, an impure humor which finds an outlet through running sores, skin eruptions, etc., but simply an unusual sensitiveness or vulnerability of the tissues, which renders them an easy prey to the various causes of disease, their resisting power being too feeble to maintain their integrity, when assailed by germs or other disease-exciting causes.

This malady makes its appearance in the young in obstinate catarrh, discharging ears, sore eyes, enlarged glands, various skin eruptions, diseases of the bone, etc. All these are indications, not of impure blood, but of a weak and sensitive body, and declare more emphatically than words could express, constitutional feebleness, either natural or acquired, in the child's progenitors. Who are the fathers and mothers of such children? Sometimes, indeed, they are persons whose habits are measurably correct in many respects, though in other particulars such as are likely to weaken constitutional stamina; but in the majority of cases, the parents of scrofulous children are persons who are addicted to all sorts of excesses in diet and in many other respects.

Rich food, pastry, gross foods, such as swine's flesh in various forms, fat meats of other sorts, etc., pickles, and other indigestible viands,—these find a constant place upon the family table. The digestive organs of the parents are weakened and debilitated. The blood is impoverished, and the tissues suffer deterioration in consequence. Overwork, excessive nervous excitement or taxation, expenditure of the vital force in gross and unnecessary ways,—all these things produce a feebleness of body, which, though perhaps not so readily apparent in the parents, stands out in the child in bold and unmistakable characters.

Weak Stomachs and Livers.—America is reputed abroad to be a nation of dyspeptics. Said an English physician to the author one day, while chatting in a pleasant drawing-room in London a few years ago, "I suppose, Doctor, in your practice in America, a large share of your patients are dyspeptics?" This unfavorable opinion regarding the American digestion is perhaps a little exaggerated; nevertheless, it is undoubtedly true that fully one-half the entire population suffer more or less with digestive disturbances.

Among the rising generation, in particular, it is difficult to find a dozen young men among whom at least three or four are not confirmed dyspeptics. The almost universal use of "pills" speaks of the unhappy condition of the average American liver. Overburdened with sweets in the form of sugar, preserves, confections, and candies; clogged with fats in the form of pastry, rich gravies, fat meats, etc.; goaded by pepper, mustard, pepper-sauce, vinegar, Worcestershire sauce, and every other sort of burning thing called condiments; gorged by

habitual excess in eating or holiday gormandizing,—the poor organ, after struggling years to do its duty well, abandons the task in hopeless despair, and settles down into that condition of stubborn debility called torpidity. The child of a man with such a liver is born with the same organ weak and torpid. Almost from the moment of his birth, the regular daily dose of castor-oil, or "Castoria," or some other abominable drug, begins; and thus the inherited torpidity of the liver is rendered still more torpid. Is it any wonder that the child of such a parent grows up to manhood a chronic hypochondriac, a confirmed misanthropist?

Disordered Nerves.—Visit the primary department of a large school. Look over the little faces turned up to the visitor, and observe how few of them do not show unmistakable evidence of an inherited debility of the nerves which threatens to mar the usefulness, and undermine the happiness, and perhaps make entire shipwreck of a mind which, backed by a well-balanced body and sound nerves, might be capable of attaining to the highest usefulness. The sparkling eyes, restless manner, abnormal irritability, or perhaps remarkable precociousness,—all suggest that the early maturity will be followed by an equally early decline, and that the individual's entire career will be marred by the evidences of impulsiveness and deficient judgment which are characteristic of so many young men of the present period. It is these forms of nervous excitability which produce the speculative disposition, and which incline a man to become a stock-broker or a dealer in "margins," or predisposes him to various crimes and vices, as intemperance, gambling, etc.

Some years ago a mother brought to us her son, a beautiful boy of six summers, who was suffering with that most terrible of nervous maladies, epilepsy. Almost daily the little fellow was thrown headlong upon the ground by his disorder, often injuring himself, sometimes seriously, notwithstanding the careful and almost ceaseless watching of his mother. Strict inquiry showed no cause whatever for the strange disease in the personal history of the child. The mother was a strong and healthy woman, but the father was excessively addicted to the use of tobacco and to some other vices. Here was a marked cause for the peculiar affliction of the child; and yet the father was loth to believe that his indulgence in tobacco, liquor, etc., could possibly bear any relation to his child's misfortunes.

Insanity.—Most distinctly hereditary in character is that other terrible malady of the mind, insanity. A father narcotizes his brain with tobacco, or excites it with alcoholic drinks, and the mother depraves her nerves by the habitual use of chloral or opium. Is it any marvel that the boy who happens into the world through such a parentage, shows symptoms of mental unbalance? that his mind often trembles upon the brink of mental dissolution? or that he ultimately ends his days in a mad-house? The alarming increase of insanity has become so noticeable within the last quarter of a century that many eminent men have devoted themselves assiduously to the discovery of the cause; and still the problem is partially unsolved, and the great army of lunatics is yearly augmented in this country alone by insane persons sufficient to fill a city.

Yet the asylums contain but a small portion of those

whose minds are really disordered, and who can scarcely be considered perfectly sane. There are, unquestionably, many thousands of persons—border-liners, as an eminent nerve specialist has called them—outside of our asylums and insane hospitals, who are always hovering close upon the brink, full of idiosyncracies, whims, and oddities, and ready to be driven, by some slight circumstance, over the narrow line which divides them from the class of patients who are patently insane.

Depraved Appetites.—A father uses whisky and tobacco regularly, year after year, until the poisons become fairly ingrafted into his body, and enter into his physical constitution. Is it any wonder that his children take as naturally to the use of liquor and tobacco as a duck takes to water? Sometimes the appetite for these poisons is so strong that it is practically irresistible, and the poor victim, though much against his will and better impulses, is dragged down to a drunkard's grave, powerless to stem the tide which is sweeping him away to physical, mental, and moral destruction.

Libidinous Blood.—Sensuality, or sexual grossness, is also one of the recognized and most deplorable results of bad heredity. The sons of the dissolute monarchs of Europe followed in the footsteps of their fathers' laws, not more on account of the evil example before them, than as the result of physical tendencies implanted within them by their sensual progenitors. Even the Bible affords examples of transmission of sensual tendencies from father to child through a long line of direct succession. The young man who, after attaining to years of maturity, becomes a rake, may perhaps be less responsible for his lapse from virtue than

those from whom he received the immoral bias and bad physical proclivity.

A Way of Escape.—The victim of an evil inheritance need not despair, though he must struggle against obstacles which are planted in his very constitution. There is a way of escape if he will avail himself of it. Let us consider what may be done to reverse the natural result of morbid tendencies :—

1. The individual who has inherited morbid physical, mental, and moral tendencies, should acquaint himself with the real nature of his weakness, and earnestly set to work to fortify himself in that particular. If his parents have transmitted to him physical conditions which predispose him to consumption, let him carefully avoid every exciting and generating cause of that dread disease. While his body is still growing, let him pursue such a course of physical culture as will expand the chest, and develop the breathing powers to their fullest extent. Let him carefully avoid such exposures as are likely to produce catarrh, sore throat, cold on the lungs, etc. Let him carefully secure an ample supply of fresh air at all times. In the selection of a life occupation, let him avoid sedentary employments, such as book-keeping, teaching, and other occupations which require confinement in-doors, often in a vitiated atmosphere. Let him select some light but active muscular employment which will take him largely in the open air; and let him remember all through life that he has a weak point, that he cannot afford to run any of those risks of injury to his breathing organs which many others seem to incur with impunity. By this extra care, he may not only avoid the natural result of his constitutional

tendency, but may so far eradicate it that in his children the weakness may be much less apparent, if not wholly obliterated; and by a similar course on the part of each successor in the line of descent, the evil heritage may at last be wholly wiped out.

In the same way, a scrofulous tendency may be kept in abeyance, and finally eradicated. A man whose heritage entitles him to life-long suffering with scrofulous maladies of various characters and various degrees of loathsomeness, may, by scrupulous attention to all the laws of hygiene, by means of which his vitality may be re-inforced and his physical stamina established, go through a long lifetime without realizing the results of his morbid inheritance, and transmit to his children a better constitution than that which he himself inherited. Such a person should carefully avoid excesses of every description, particularly excesses and errors in diet.

The dietary should consist chiefly of fruits, grains, milk, eggs, and the better class of vegetables. Flesh food should be sparingly used, and gross animal fats should be wholly discarded from the dietary. An abundance of nourishing but simple food, such as may be easily digested and rapidly converted into good blood, should constitute the bill of fare of such an individual. Special attention should be given to cleanliness and exercise in the open air; and temperance and moderation in all things should be assiduously practiced by such an individual.

The young man who finds himself an inheritor of a weak digestion or sluggish liver, should scrupulously avoid all those causes which are recognized as efficient producers of stomach and liver disorders. Simplicity in

diet should be the rule of his life. The avoidance of sweets, fats, condiments, excesses in the use of animal food, and excessive eating, even of wholesome food, he should consider as binding upon him as the precepts of the moral law. He should lay down for himself the most rigid rules for the government of his dietetic practices, and religiously adhere to them. By this means, the digestion may gradually be made stronger, and even inherited dyspepsia finally outgrown.

The man whose inheritance is a weak nervous system, who has irritable or sensitive nerves, should at an early period in life set about caring for this part of his bodily organization by avoiding excesses of every sort. His stock of nerve force is low, and he must economize his expenditures in every possible manner. Extravagant drafts upon his nervous system should be most scrupulously avoided. By this means, he may hope to counteract the effect of the bad heritage, and save adding one more to the great army of sufferers from a wrecked nervous system, to be found in every civilized land. Such a person should above all cultivate evenness of temper, calmness of mind, coolness of judgment, and self-control. By the aid of such efforts as these, he may hope to keep at bay the multifarious foes which threaten to assail him in the guise of neurasthenia, or nervous exhaustion, and numerous forms of nerve disorders.

The man who knows that he is born with a mental drift toward the mad-house, should industriously cultivate a bias in the opposite direction. Let him avoid excitements of every description. Let him hesitate long before undertaking any enterprise which demands

severe and continued mental strain. Let him recollect that his physical machine has a weak spot in it, and that it must be run at a low pressure. He must learn to be quiet, to go slow, to be moderate, to take the world easy, and to keep cool. Such a man may go through a long lifetime without a mental breakdown, by the use of proper precautions; whereas, if he neglects them, a sudden and unusual strain may at almost any time destroy his mental equilibrium, and send him to a lunatic asylum.

The Liquor Appetite.—A boy who is born with a natural taste for liquor or for the indulgence of other stimulants, should know that the natural liking for these poisons does not in the slightest degree lessen their injurious effects upon the body. The appetites themselves indicate a morbid condition of the nervous system, which, while it produces an intense craving for stimulants and narcotics, renders the system less able to withstand the deleterious effects which their use invariably produces. No man, no matter how strong his hereditary liking for stimulants, is absolutely compelled to resort to their use. If such a man will contend against the disposition with sufficient vigor, he may thoroughly master the morbid appetite; the conflict may be a bitter one, but one who makes an honest and persistent fight, will be a victor in the end.

The youth who finds himself the unfortunate inheritor of strong and clamorous passions, which, unrestrained, will lead him down to physical and moral death, certainly has before him a physical and moral conflict, compared with which the bloodiest fight in ancient Roman days was but a playful game. By nature, he is destined to

be an easy prey to the siren voice of the tempter. For such, One has said, "My grace is sufficient for you." A life of temperance, sobriety, and purity will gradually subdue the evil demon; but if physical means fail, religion affords a source of never-failing strength to him who devoutly seeks its aid.

Thus it appears that even he who is heir to disease, infirmity, and vice may by persistent efforts escape the dire calamities which are the natural results of the physical bias of his constitution.

How to Make Life a Success.

TOO many boys, possibly the majority, grow up to manhood, and allow themselves to drift on through life without any definite purpose to make a success of anything, and, indeed, without any very clearly defined idea of what success really is. It is not for this class that we are writing. This chapter would probably do such persons no good. This is written for the benefit of those young men who aspire to real success in life, and who desire to leave behind them some mark to indicate that they have not lived in vain.

What is True Success ?—First let us inquire, What is real success ? One may answer, Success is to become the owner of a large farm well stocked with horses, cattle, and farm utensils, supplied with capacious barns, and ornamented by lawns and trees and a beautiful dwelling. In the estimation of another, the man who becomes the owner of a bank, and has vaults filled with gold and silver, and thousands at interest with good security, is the really successful man. Still another considers him most successful who becomes famous as a lawyer, an orator, or a politician who attains to some eminent position in the State, and whose name is in everybody's mouth.

They who succeed in these various ways may be looked upon in a certain sense as successful; but the possession of lands, or gold, or fame, or a high position in society or in the State, cannot be considered as true success. Indeed, to fail in the effort to secure some ends which are considered essential to success, may be far more successful than to succeed. Success in all the directions mentioned may be attained by ways and methods by no means calculated to make a man happy in possession of that which he sought. For example, wealth is often obtained by dishonest means, by oppression, and by neglecting and ignoring the rights of others. Political honors are perhaps most frequently obtained by the employment of questionable means. Honor is often won by men who have secured it only by depriving others far more worthy than themselves of their lawful rights.

True success can never be realized by a man who seeks for success alone. A man who has before him no higher aim in life than simply to attain success, will not be likely to succeed in the truest sense. Such a man, being actuated chiefly or solely by ambition, will be almost certain to descend to the employment of means for the attainment of the desired end which are inconsistent with the character of one who truly succeeds.

True success is never sought for, but comes as the glorious reward of a life spent in devotion to duty, the steadfast adherence to true and noble principles which in their triumphal march carry with them all who have given to them their full and true allegiance. The man who thoroughly succeeds, is he who finds his triumph in the victorious success of the principles to which he

has attached himself. He may have endured hardships, braved dangers, and suffered persecutions; but all along he has stood steadfast for what his manhood and conscience taught him to be right and true, never thinking of success, but only of his duty, and is at last rewarded by finding himself elevated to the galaxy of heroes. He finds his triumph in the triumph of the glorious truths to which he has so steadfastly adhered.

All men are not so fortunate as to enjoy in this life the realization of what may be considered by the world as success; but all may yet feel that life has not been a failure, but has instead been in the highest degree successful, if they have sturdily adhered to true and genuine principles, and have earnestly fought against error, vice, and sin in every form.

It thus appears that a man who seems to be successful may not always in the truest sense have been such; while a man who seems to have made life a failure, may in reality have made it a genuine success. Again we say, the man who will make life a great success will not be he who works and lives for success alone, but he who seeks with earnestness and true loyalty to do his duty, always and everywhere to stand up for truth and pure principles. Such a man will himself be loved and respected for the principles which he upholds, and elevated to the topmost round of the ladder of real and genuine success.

Have an Aim.—While the whole energies should not be devoted to the simple attainment of success, it is necessary that every person who desires to succeed in life should first of all possess some aim or purpose, some well-defined object toward which his efforts shall be

directed. A man without an aim is like a ship at sea bound for no port or country in particular, and with no rudder, or no helmsman at the wheel, at the mercy of the winds and waves, and liable to be driven upon shoals and rocks, or stranded upon some strange and desolate shore.

Singleness of purpose has been the characteristic of nearly every man who has made his mark in the world. Columbus, Napoleon, and Washington succeeded only through steadfast adherence to a single purpose, and the bending of every energy to the accomplishment of that object. It is of the greatest importance that the object, whatever it may be, shall be clearly defined. One who has simply a vague aim at something great, a vast mysterious something, without definite outline or substantial form, is like a desert traveler following a mirage, or a marksman shooting at a fog. The aim should be definite, distinct, and sharply outlined, and must be sufficiently elevated and noble to call out the highest and noblest efforts of which the individual is capable.

It must be premised, however, that the aim shall be one within the possible reach of the individual. Every man cannot be a president, a governor, or a silver-tongued orator; and it would be a misfortune if every boy or young man should build up in his imaginary future a presidential or a gubernatorial palace. Indeed, it is quite doubtful whether it is best for any one to start out in life with the distinct purpose of seeking political preferment or official position. The professional politician is almost necessarily a wire puller,—a purchaser of votes, and a purveyor of official perquisites. No man of high and noble instincts can afford to devote his life

to the business of running a political machine or manipulating caucuses. Let the general aim be to be a good citizen, a useful member of society, a genuine man, and as much more as circumstances and opportunity may permit.

Concentration of Purpose.—Having selected an object worthy of one's best efforts, let a man devote his whole energies to its attainment. Let him, with true singleness of purpose, seek by every legitimate means to secure the accomplishment of the purpose upon which he is determined. If patient, laborious preparation is required, let him unflinchingly devote himself to the work. If moral courage and mental firmness are the requisites, let him fortify his soul for the conflict. Let him not weaken his strength by dividing his energies among divers conflicting matters; in other words, do not try to grasp too much at once. In so doing he may fail entirely. The power of concentration is one of the most difficult attainments of all mental qualities. The ordinary mind is readily diverted by new scenes and objects of interest; but the mind which has undergone the discipline essential for the attainment of true success, fixes itself upon the single object with a grasp so firm that nothing but death can release its hold.

Perseverance.—We need not dwell upon the need of perseverance for the accomplishment of any great purpose. The great number of human beings whom we see all about us, who have failed to make life a success, have, in the great majority of instances, been driven from the road which leads to sure success by the shifting winds of vacillation. Yet most of them

have been once well started upon a promising road, but have been driven from the safe highway into the mazes and quagmires of uncertainty by some will-o-the-wisp of great expectations, brilliant and alluring in the distance, but vanishing in thin air when just within hand reach. Nevertheless, a simple, plodding sort of dogged, unreasoning perseverance must not be considered a sure passport to success.

The old adage, "Let well enough alone," is probably quite as often misapplied as otherwise, as there are plenty of people who do not know what "well enough" is. Some are well content with the most meager measure of success; while others are never satisfied even with the most bountiful harvest or the most generous returns from their labors. And that other old adage, "A rolling stone gathers no moss," is equally liable to harmful application; for the man who stupidly pecks away all his life in a barren hole in the hill-side, in the hope that he may strike a vein of rich ore if he perseveres long enough, is certainly no more likely to succeed than the one who hurriedly skims along the surface, turning up a clod here and overturning a rock there, but never stopping long enough in one place to discover the precious metal, even though it may have been hidden from his eyes by but the merest film of earth. If after an honest effort to succeed in any direction, the obstacles presented prove to be really unsurmountable, better turn at once to something more promising than to beat one's brains out against the dead wall of impossibility.

Thoroughness.—"Whatever is worth doing at all, is worth doing well," is an old adage, the truth of which

has never been denied, although now and then, it must be confessed, an apparent success may be obtained by the most imperfect and superficial work. In many respects, the American people are far inferior to those of some other nationalities in the execution of enterprises specially requiring the exhibition of this trait of character. The average American loves to accomplish the desired end by one supreme effort, by a grand, dashing display of his powers. The phlegmatic German, however, sits down to his task, quietly gathers about him the means by which it is to be accomplished, efficiently and methodically develops each feature of his work, and finally presents it a perfect and complete whole, symmetrical in all its particulars, and a model for all workers in the same line who may succeed him. Place the product of his genius along-side that of the brilliant, dashing worker. The contrast is that of a marble statue chiseled by a Carnova or a Michael Angelo, compared with one of the rude wooden images set up in the roadside chapels of an Italian highway.

Napoleon won his great battles by his thorough attention to all the little details of preparation. He anticipated every possible contingency, and was prepared for every emergency. So it is in the battle of life; the habit of giving earnest attention to details, of "taking pains," even in the doing of things seemingly of trivial importance, will often secure the prizes which the brilliant but hap-hazard and irregular efforts of others may fail to reach.

Yet it must be conceded that even this quality may be so greatly exaggerated as to become an impediment to progress, rather than an aid to success. The man

who spends all his energies in elaborating and perfecting non-essential details, is like the man who busied himself in driving the cows out of his garden to save his cabbages, while his dwelling-house, with its valuable contents, was being consumed by fire.

Faithfulness.—Reliability, even in matters of small consequence in themselves, has often proved the stepping-stone to rapid advancement and business prosperity for young men who could boast no special talent, and possessed no special qualification for the place they were called upon to fill. Merchants, bankers, and business men of every rank are daily inquiring for young men who can be relied upon, and in whose hands important trusts may be reposed without danger that they will be betrayed. The want of this characteristic is what leads to the shameful defalcation of bank cashiers and presidents, and the general feeling of distrust and insecurity which has arisen from the great commercial panics growing out of the dishonesty of men in whose hands great pecuniary trusts have been placed. Any young man, no matter how meager may be his natural abilities, if he will improve his opportunities, may win for himself a useful and an honorable place in society by the unwavering cultivation of trustworthiness.

Be Practical.—Half the bad failures in life are due to a want of practical ability, of that combination of traits of character which enables a person to discriminate between useful things and those which are of no consequence; between things of great import and those of trivial importance; to determine promptly what is best to be done in emergencies, and to be able to adapt one's self with readiness to changing circumstances. The

visionary dreamer never succeeds, because his whole energies are devoted to the elaboration of schemes which can never be carried out, and which, if they could be, would be of little or no practical value to the world.

In the patent offices at Washington may be seen many thousands of ingenious mechanical devices, not one in a hundred of which has ever been put to any practical use, and never will be seen outside the rooms where they are stored for exhibition. Most of these are the result of days, months, and even years of labor on the part of men whose inventive faculties ought to have enabled them to render valuable service to their fellowmen; but which, unfortunately, not being balanced by the necessary qualities to render them of practical value, have been squandered in the invention and construction of machines for doing what nobody ever cares to have done, or what can be accomplished by much simpler and better means. Every neighborhood has its perpetual motion maniac, who ought to serve as a living example to all to whom he is known, of the futility and folly of spending time and efforts in trying to accomplish impossibilities.

The term usually applied to practical ability is "common sense." Every one is supposed to have a share of common sense; but our experience with the world has led us to the belief that this is of all mental qualities the rarest, and would be more properly termed "*un*common sense." Fortunately, it is a quality which can be developed, though the man must be considered fortunate indeed who inherits a large share of this element in his mental make-up. Persons who

have common sense always reason about things. They never act without considering the why and wherefore of what they are about to do, and are continually inquiring the reasons for what they see transpiring about them. A large fund of common sense is of vastly more value to any man than the most finished course of instruction at a university; and one who is lacking in this essential quality will find that no amount of "book learning" is a substitute for it.

Learn by Experience.—All persons, even the wisest and most cautious of men, will sometimes make mistakes, but the wise man takes care that he does not frequently repeat the same error; while the man who is lacking in the quality which we have termed common sense, goes on committing the same blunder again and again, utterly regardless of the consequences which his experience has told him will invariably follow. A philosopher once said, "Experience keeps a dear school, but fools will learn in no other." Unfortunately, there are those who will not learn even by experience. When we find that we have made a blunder, we should carefully consider the causes which have led to the calamity. When discovered, they should be carefully noted in our minds, and due care should be observed that we do not fall into the same error a second time.

Many things we may learn and must learn by personal experience. Some, perhaps, cannot be so well learned in any other way; but life is too short to enable us to try every experiment possible, and we can ill afford to suffer the loss which would result by the constantly recurring blunders of a life wholly devoted to original experiment. Hence, it is wise for

us to profit, as far as possible, by the experience of others whose lives may have fallen in the range of our observation. He is certainly a wise man who will appropriate to himself, so far as possible, the experience of his fellows and his predecessors; and, thus equipped, with the accumulated knowledge of the world, he will be able to accomplish vastly more, and do his work far better than one who trusts simply to the uncertain results of his own individual experience.

Genius and Luck.—How often do we hear the remark, "He was a genius," "He was bound to succeed," or "What a lucky man he was!" It is a mischievous popular error that genius and luck are the two magic influences which have enabled the majority of successful men to rise so far above their fellows in the particular lines in which they have attained eminence. It is not to be denied that some men are specially adapted for certain walks in life. Then it is certainly a matter of importance that each one should, if practicable, occupy the position to which he is best adapted, and in which he is most likely to succeed; but those who have given the greatest amount of study and thought to this question, are unanimous in the opinion that the qualities which constitute genius are by no means uniformlly extraordinary brilliancy of intellect, but far more commoniy consist in an unusual ability and disposition for close and continual application. A man of genius succeeds where another man fails, not simply because he has greater intellectual powers, but because he applies his mind to the subject which he has in hand with greater intensity, and pursues it with greater perseverence and more searching, penetrating thought than his unsuccessful colleague.

So with luck. So-called luck rarely consists simply in the occurrence of favorable circumstances; but far more frequently the secret consists in the fact that when the particular circumstance occurred, which was thought to bring the fortunate man luck, he was prepared to embrace the opportunity, and make the most of it, while his unsuccessful rival was engaged in a preliminary preparation without which he could not avail himself of the opportunity offered. The lucky man is not the man who, like "Micawber," is waiting listlessly for "something to turn up," but the man who is industriously preparing himself for anything that may turn up, and persistently working to turn something up whereby he may succeed in accomplishing the purposes at which he aims.

Promptness and Energy.—Whatever you undertake to do, put your whole soul into it. The world is full of half-hearted men,—men who are not quite certain whether they are wide awake or dreaming,—men who have latent energies sufficient to raise them to the loftiest hights of human greatness, but whose dull sensibilities allow them to lead lives scarcely higher in their aims and purposes, and little more effective in their results, than those of the dumb brutes, beside whom they toil in the fields and along the highways. It is easy enough to drop into this great army of creeping human animals, whom the energetic but inhuman Napoleon pronounced "food for powder." He who aims at a higher and better life,—a life crowned by victories achieved and triumphs won, must rouse every energy and summon every latent power within him, and plunge into the arena of life with an unfaltering determination to conquer something or die in the struggle. It requires no effort to float like a cork

upon the tide of human life, or sink like a leaden weight beneath its surface; but to brave the seething flood and stem the mighty current, demands a stout heart and a steady nerve.

Economy.—A man who has reached forty years of age and has not acquired a competency, that is, has not laid up an amount sufficient to provide himself and family with the necessaries and comforts of life, with a balance in store for emergencies and illness, has either been a victim of serious and unusual misfortunes, or he has been a spendthrift or a sloven. The amount of wealth which a healthy man is able to accumulate each year is sufficient to amount, in twenty years, to a sum large enough to pay for a comfortable home, besides covering the expenses of living, even though the individual is able to earn only the wages of a common laborer. In a vast number of instances, poverty is the result, not of misfortune, but of unthriftiness. We frequently see poor persons who are very industrious in their habits and who command good wages, and yet are always in poverty. These persons, as well as others who have an abundance of wealth, are almost invariably spendthrifts of time, money, and health. All of these are valuable possessions, which we should treasure with care. Time is valuable because it is equivalent to money. If not uselessly spent, it may be employed in such a manner as will produce something for the good of the individual or for the benefit of the world; hence it is our duty to spend our time in such a way as will enable us to accomplish the most for ourselves and for others. The waste of time is one of the most common of all squanderings. So often we hear an individual say, "My time is my own, I can

do what I please with it;" but we are responsible for our time. Each moment should be profitably employed, not necessarily in working always, but in such a manner that it will in some way result in value to ourselves or to some one else.

Money is often wasted in the purchase of things which we really do not require. Probably three-fourths of all our expenditures are not absolutely needed for either health or comfort. We spend most of our money for luxuries which do us harm rather than good, and thus occasion a double waste.

Lastly, we mention the waste of health, which is a far more serious matter than the simple waste of money. Money squandered may frequently, by painstaking effort, be regained. Health squandered, can in many cases never be fully restored. The waste of health is one of the most inexcusable of all wastes. For a few moments' pleasure in the harmful indulgence of appetites or passions, we receive in exchange hours, days, months, years, a lifetime of misery and suffering. Health is one of the choicest of our possessions, one of the most essential to the enjoyment of all our other faculties and blessings; hence it should be highly prized and carefully guarded.

True Merit Wins.—We meet people every day who are complaining that the world does not appreciate them. Their friends fail to recognize their abilities, according to their view of the matter, and they are not afforded the opportunity for displaying their talents which they deem they ought to have. These persons have been very truly called "chronic grumblers." The merits which they possess, as a rule, are present in their own imagination alone. If they have any special ability,

their anxiety that they should be appreciated and recognized so disgusts those with whom they come in contact as to prevent such a recognition. If, after giving the world a fair chance to form a judgment of our abilities, we find no recognition of the special claims to distinction on our part, we should feel pretty well convinced that we have been duped by our own self-complaisance, and that we have no such extraordinary merit as we had come to believe. In the long run, and in the majority of instances, the world puts a man where he belongs. If a man has true merit, some person or some circumstance will find him out, and bring him to the front. He has only to bide his time, patiently developing his talents and enlarging his resources; and when the proper time comes, he may depend upon it there will be a place for him. Nothing affords a more unpleasant spectacle to people of common sense than a man of meager abilities elbowing his way through the world, running hither and thither, proclaiming to the world his talents, and begging that he may be recognized, and that room may be made for him in some position for which he imagines he is peculiarly fitted. The world is naturally, and very properly, suspicious of such persons, and they should not take it hard if they are now and then severely snubbed. It usually takes a large amount of snubbing to convince these pretentious and pompous blusterers that there is an essential difference between "brass" and brains, or that a man may have a great amount of "cheek" with very little intrinsic merit.

Self-Respect.—Few traits of character are more repugnant to the refined and cultivated taste, and more opposed to genuine good sense, than overweening con-

ceit, or self-esteem; but self-respect is a quality of character which excites respect in others, and it may be said that the amount of respect ordinarily accorded an individual will be largely in proportion to his own respect of himself. Self-respect and conceit are two very different traits of character. Conceit leads an individual to think himself to be something more than he is. In his own estimation, his qualities are exaggerated to a degree often positively ludicrous. Self-respect, on the other hand, leads a person to fairly estimate his own qualities, rather underrating them than otherwise, but leads to a knowledge of his own qualifications and real merits; and his genuineness of purpose, and self-reliance will constitute the most essential elements of his success. Without self-respect and a degree of confidence in one's abilities, one's course in life is apt to be cowardly and vacillating. A healthy self-confidence is one which is the result of a thorough recognition of the thing to be attained, of the means and efforts required for its attainment, and the consciousness of an honest and thorough preparation for the undertaking.

Self-respect is one of the most powerful incentives to virtue and purity of life. That was a noble reply made by the lad who was tempted by another to commit a wrong act by the plea, "No one will know it," "But, sir, I shall know it myself." The consciousness and self-condemnation of wrong doing is to a man with large respect a very powerful protection from it. Cultivate self-respect by avoiding most carefully every act or thought which lowers your own esteem of yourself when you sit in judgment upon your own heart and life, and in so doing you will make yourself worthy of the esteem and

respect of others, and you can depend upon it that your true value will be in due time appreciated.

Genuine Gentility.—Last, but not least, we mention, as an essential element of real success, the character and the manners of the true gentleman. We do not propose to lay down specific rules for conduct, but to urge the importance of cultivating civility and courtesy of manner toward others. The boy who is gentle and kind of heart, no matter how rough his exterior, will be regarded by those with whom he comes in contact, with kindly feeling, which is always inspired by real purity and genuineness of character. The place for a boy to begin to cultivate true courtesy and gentleness of manner is at home. Respectful deportment toward his parents, kind and gentle treatment of his brothers and sisters, and a courteous manner toward all, under all circumstances, if assiduously cultivated at home, will establish a charm of manner which will accompany the individual through his entire life, and will constitute a very important element in leading him to that success which a person who adopts these suggestions, most highly deserves. A man whose manner is suave and affable, makes friends even of his enemies, and at once disarms prejudice by the evidences which his outward manner gives of real gentleness of heart. A fawning sycophancy of manner is wholly unworthy of any one who claims to be a gentleman; but real courtesy is always becoming in all persons and under all circumstances.

Boys are apt to think that while they should be courteous to strangers, with their relatives and friends, and especially their school-mates and "chums," they may

neglect the little courtesies and civilities which they would promptly accord to a stranger. This is a very great mistake. This very neglect often leads to the destruction of friendships which have existed for years, and might have been life-long, and frequently gives rise to hardness and even bitter enmity. Besides, in order that one should possess that grace and charm of manner which a true gentleman exhibits, he must keep in constant practice, by treating all his associates with the same kindness and civility with which he would treat them if meeting them for the first time as strangers, upon whom he might wish to make a favorable impression.

STOMACHS.

AN eminent zoologist defines an animal as "a stomach with various organs attached." The definition is a very good one, and perhaps applies equally well to some men; but a human being ought to be something more than a stomach with other organs attached. The business of the stomach, as we have elsewhere seen, is to supply the body with the needed material to renovate its tissues and its energies. As soon as the stomach fails to do its duty, the whole body begins to decline. Every tissue begins to suffer from starvation. Every bodily process flags. The muscles become flabby, the nerves become irritable, the brain becomes confused, and the mental powers languish. The stomach is to the body what the furnace is to the steam-engine. It receives the supplies of material out of which blood, brain, and muscle are formed, and which, through the wonderful chemistry of nature, are elaborated into thoughts, feelings, actions.

Importance of Proper Food.—The old German proverb, "As a man eateth, so is he," is an exact statement of a scientific fact. If a man eats gross food, his blood will be gross, his tissues will be gross, his brain

will be gross, and he will have gross thoughts, and very likely will commit gross acts. The Concord philosopher says, "The man who lives chiefly upon hog is in danger of becoming piggified." The young lady who lives chiefly upon pickles and bread and butter, with a liberal supply of mustard, washed down with strong tea or coffee, must be expected to have a temper as acrimonious as her diet. A man whose bill of fare consists chiefly of flesh food, must expect to find himself more nearly related to the animal in his instincts than the man who satisfies his palate with milk, fruits, and farinaceous seeds,—the primitive diet of the human family. Byron refused to eat flesh because, as he said, "It makes me ferocious." Writing in his journal in 1814, he said, "Meat I never touch. . . . The worst is, the Devil always comes with it till I starve him out; I will not be the slave of any appetite." No man knew better than Byron, a man of strong appetites and passions, the influence of diet upon both mind and body. Many have recognized the same truth which he expressed, but comparatively few have shown the same resolution in making a practical application of it.

The man who wants to make the most of himself will take care that his body is built out of good material; in other words, will use discretion as regards the sort of stuff he puts into his stomach. The Hebrews could make brick without straw much more successfully than the system can make good brains out of strong coffee, Saratoga chips, and fried sausage.

The bustling business man sits at a table in a down town restaurant, calls for a bill of fare, rattles off an order to the waiter, and presently finds himself sur-

rounded with a dozen dishes containing as many varieties of abominable mixtures called "French cookery," which he supposes his stomach will convert into material for brains, with which he will be able to devise sharp schemes for money-getting, and which will again convert brains into dollars. But the transmutation does not take place according to his calculations. Half an hour after dinner his abdomen swells up like a base drum, his cranium feels like a cabbage head, his heart pounds away like a fire-engine, and he runs off to the doctor to get him to feel of his pulse, look into his eyes, and tell him if he is n't going to have a stroke of apoplexy, or if he is n't threatened with softening of the brain, from too much mental work, and if he had not better take a trip to Europe or visit some celebrated mineral spring, with a taste of sea water and a smell of perdition. If the doctor has the good sense and the bluntness of old Dr. Abernethy, he will say to him, "You are a fool and a glutton. Stop stuffing yourself with roast goose and cranberry sauce, fricasseed liver, pig's feet and *pate de foie gras*, and making a gormand of yourself. Treat your stomach decently, and your brains will be all right."

Not Worth Eating.—When one sits at a hotel table, and observes what sort of stuff people are trying to makes bones, muscles, and brains out of, he is constrained to think that a human stomach must be made of cast-iron, or that there is a day of trouble and retribution coming. If you ask any of those people if they ever suffer with indigestion, they will invariably reply with indignation in their tones, "*Never*." Watch the same people after dinner for half an hour, and you will see them gulping up offensive gases out of their stomachs,

drinking noxious draughts of alkaline mineral waters at the drug store, or swallowing big doses of some neutralizing cordial, never once thinking that the indigestible stuff which they bolted at the dinner table has anything to do with the horrible state of affairs under their jackets. Some years ago an itinerant clergyman, traveling through a Western State, spent a night with a farmer, and in the morning sat down with the rest around the breakfast table, to prepare for the long horseback journey which lay before him. The host invited him to ask a blessing upon the food about to be eaten. The reverend gentleman glanced over the table, taking a mental inventory of the food prepared for the dozen hungry mouths awaiting it. There were hot biscuits steaming from the oven, semi-transparent with lard and yellow with saleratus; there were savory mince-pies, rich preserves, pickles green as grass, coffee black as ink, fried pork, fried eggs, fried potatoes, and a generous supply of fried cakes on the sideboard. Pausing a moment, after his survey of the indigestible viands, with a solemn voice the clergyman said, "Friends, this breakfast is not worth a blessing," and concluding that a breakfast not worth a blessing was not worth eating, he went on his journey without it. The farmer doubtless considered the blunt preacher a very ungrateful guest, and it is doubtful whether the lesson was of any practical value to him; but certain it is that a great share of the breakfasts and dinners eaten are not fit to be blessed or to be swallowed.

Food, to be worth eating, must consist of such material as will properly nourish the body, and in such form as will be easily digested. It is also necessary for

the welfare of the body that the food should consist of different nutritive elements in proper proportion. A man who undertakes to live upon sugar, or fat, or starch, or albumen, exclusively, will die almost as soon as a man who eats nothing at all, although a mixture containing each of these elements in proper proportion is capable of sustaining life indefinitely.

How Much to Eat.—Given proper food, properly prepared, one of the first questions which arises is, How much must a person eat to sustain life and keep himself in good working order? Everybody knows the story of Cornaro, the dissipated Italian who found himself a wreck at thirty; but by adopting a vegetarian diet, consisting of ten ounces per day, was able to prolong his life to a full century, and found himself when an octogenarian more active and vigorous than when a youth of twenty. A Frenchman lived for many years, working hard and preserving good health, on fourteen ounces per day. On the other hand, a Roman emperor ate as many pounds of meat *per diem*, and an Esquimau has been known to eat as much at a single meal. The amount of food required varies with each individual, with weather changes, and with the kind and amount of labor performed. The only proper guide to the quantity of food is a healthy appetite; and when the palate is not tickled with savory comestibles, and the appetite stimulated by irritating condiments, nature will invariably say, "Enough," when a full allowance has been taken, by substituting a sense of satiety for the keen relish of hunger. A person, when no longer feeling a real demand for food, should stop eating.

Relation of Climate and Occupation to Diet.—As regards the influence of weather and occupation upon eating, it may be briefly said that we need to consume more food in cold weather than during the warm season, for the simple reason that one of the most important uses of food is to furnish fuel to keep us warm. In cold weather, the consumption of fuel in our bodies, as well as in our stoves and furnaces, is necessarily greater than in the warm season; and hence we need a larger supply of food. Hard muscular labor, accompanied by active mental occupation, consumes the greatest amount of tissue in a given time, and produces the demand for a larger amount of food than either purely physical or purely mental occupations. The hard mental worker really requires as much food as the muscle worker, but should remember that he can indulge in excess with much less impunity. The woodsman, whose monotonous occupation makes of him practically a mere chopping machine, consumes without apparent harm, several pounds daily of coarse and indigestible food, and a surplus of bodily energy enables him to digest what would be absolutely poisonous to a brain worker of sedentary habits, who can take with safety only just so much as his system actually requires. For the average man, the amount of food required each day probably varies not far from one and one-half pounds of dry graham bread, or its equivalent in other foods.

Danger of Eating too Much.—There is vastly more danger of eating too much than too little. The mother who fears her child may starve to death before morning if sent to bed without its supper, would undoubtedly find it difficult to believe that Dr. Tanner could live

forty days without tasting food, a period which has been in other instances of fasting considerably exceeded. The manner of taking food is a matter of quite as great consequence as the quantity eaten. The very best food, hastily bolted, after the fashion of the average American, may be digested less perfectly than food naturally difficult of digestion, but which has been deliberately and thoroughly masticated. It is reported of Mr. Gladstone that he requires his children to make forty movements of the jaws for each mouthful of meat before swallowing it; and if the ex-prime minister himself follows the same rule, this may possibly be one of the secrets of the remarkable strength of mind and body which enable him to do more work at the advanced age of fourscore years than most of his countrymen are able to do at half that age. The tendency to hasty eating may be greatly lessened by the avoidance of liquids at meals. The free use of drinks at meals is also objectionable, as it dilutes the contents of the stomach to such a degree as to overtax the absorbents, and thus delay the digestive process. Persons who are troubled with thirst at meals, may avoid the necessity of drinking by taking a glass or two of water an hour before the usual time for eating.

Evils of Hasty Eating and Overeating.—The symptoms which result from hasty eating and overeating are very similar. Indeed, the two processes are very likely to be combined, as one who eats too fast is very likely to eat too much. The most common sensations after excess or abuse of the digestive organs in this way are a sense of fullness at the stomach and drowsiness after eating, which are pretty likely to be followed an hour or two later by eructations of gas, with heart-burn or sour

stomach, the result of fermentation of the food. After a time, the digestive organs may become so weakened that even a small quantity, though properly eaten, will be very imperfectly digested, and the whole system suffers in consequence.

Indigestion is something more than simply an inconvenience. A body which is served with food by a dyspeptic stomach, receives very poor material of which to rebuild its tissues. None of the food is perfectly digested, and hence the quality of all the tissues is deteriorated. Besides this, the septic changes which take place in the stomach and bowels produce various poisonous substances, which are absorbed along with the food, and which poison and irritate the brain and nerves, and produce various disorders and discomforts which are ofttimes attributed to other causes. Even the imperfectly digested food is treated by the system as waste or poisonous material, and instead of being used to repair the wastes of the body, is excreted, or thrown off, by the liver and kidneys with the waste elements of the system.

The stomach sometimes holds up wonderfully under the heavy burdens laid upon it, and digests a much larger amount of food than is necessary to supply the wants of the body. In such cases, the excessive amount of nutriment received is either at once excreted, or accumulates in the tissues, clogging the various organs and interfering with their proper activity. Accumulations of this sort are the chief cause of gout, rheumatism, biliousness, and numerous other disorders which are usually attributed to other causes.

Eating when tired, and engaging in active mental or

physical exercise immediately after a hearty meal, are two of the most common sins against dietetic rectitude in our modern civilization. An old medical writer tells us that a hundred years ago it was the custom among the merchants of Edinburg to take two hours' "nooning" for dinner in the middle of the day, during which time the shops were closed, and all business suspended. It is quite hopeless to attempt a resurrection of this good old-fashioned custom in these fast times; and the best thing we can suggest is that no hearty meal should be eaten during the active business hours of the day, unless at least an hour or two can be allowed after the meal has been taken, to give the stomach opportunity to get the digestive process well under way. The plan which our personal experience leads us to prefer is to defer the hearty meal, as did the old Romans, until the latter part of the day, say four o'clock in the afternoon, taking, if necessary, an apple, a bunch of grapes, an orange or two, or some equally simple food at midday, to appease the clamoring of the stomach, until it has become accustomed to the lengthened interval between the first and second meals. Two meals a day are in every way preferable to a larger number. The ancient Greeks and Romans took but one meal *per diem*. During the republican era, the Roman custom was to eat twice a day, breakfast being simply a light repast of fruit and bread. At the present time, the two-meal-a-day plan prevails quite extensively in France and Spain, and especially among the better classes. The inmates of the hospitals in Paris are supplied with but two meals a day. The same is true respecting the soldiers of the French army.

A Carnivorous Appetite.—When the practice of meat-eating was introduced into the human family, history does not positively inform us, but certain it is that primitive man was not carnivorous in his habits. In this one thing, at least, Darwin agrees with Moses. Bible accounts represent man in his primitive innocence as subsisting wholly upon the fruits of the soil. Darwin professes to trace back the origin of the human family to the megatherium, a four-handed beast that obtained its sustenance from the fruits and ground-nuts of the primeval forests through which it roamed. Pythagoras, one of the most renowned of Grecian philosophers, was a rigid vegetarian, as were all his followers. More than one modern philosopher has found himself able to do his best work when imitating the plan of Byron, who, during his stay in Venice, wrote to a friend, "I stick to Pythagoras." Plato and Seneca, two other celebrated philosophers, were vegetarians, as was also Shelley, and Benjamin Franklin, at least during a portion of his life. The great Newton, while writing his most celebrated mathematical treatises, abstained wholly from animal food. Wendell Phillips, the "silver-tongued orator," informed the writer a few years before his death that for fifty years he had been a practical vegetarian, and rigidly so during a considerable portion of the time, though while traveling about the country, he sometimes tasted a little fish when meagerly supplied with wholesome vegetable food. The author of "Little Women," as well as the little women themselves, as we were informed by her father, the eminent Concord philosopher, were all vegetarians The writer has been a vegetarian for more than twenty years; and from personal

experience is convinced that the practice is in every way conducive to health, and is capable of sustaining mental and physical strength during protracted and most arduous labor, both physical and mental.

It must be allowed, however, that meat may be used in moderation in connection with fruits and grains, without great apparent detriment, except when the flesh is obtained from a diseased animal, which, unfortunately, is an accident quite liable to occur. Trichina, tape-worm, and other parasitic diseases, besides consumption, possibly scrofula, and some other constitutional maladies, are liable to be contracted by the use of the flesh of diseased animals. Certain it is that young persons may dispense with the use of animal food with perfect safety. Milk is a perfect substitute for all the good qualities of flesh food; and it is not impossible, as has been suggested, that parents may often find cow's milk far better than cow's hide in the management of hot-headed and refractory sons.

A Few Prescriptions

FOR SICK STOMACHS.

SOUR STOMACH.—Said a lean, cadaverous looking man to the writer one day, "My stomach is just like a swill barrel." The expression, though not elegant, was certainly appropriate as well as significant; for no sooner would the poor man swallow his dinner than it became converted into a sour, fermenting mass, which he was soon glad to rid himself of, provoking vomiting by thrusting his finger down his throat. In this wretched condition he had been for months, indeed, much of the time for years, and had sought relief from doctors of all pathies, and from patent medicines of every description, until at last he was almost in despair of ever being rid of his "tormentor," as he styled his dyspeptic stomach. The following was the poor man's prescription:—

One hour before breakfast, drink two or three glasses of hot water to rinse out your sour stomach, and get it in fit condition to receive the morning meal One hour before dinner do the same. Half an hour before going to bed, again rinse out the stomach by two or three glasses of hot water. For breakfast, take two or

three glasses of hot milk, sipping it slowly and eating along with it a couple of generous slices of graham bread, toasted in the oven until hard and brown. For dinner, take bread and meat instead of bread and milk, a tender steak or mutton-chop, free from fat, broiled rare and without butter. For supper, nothing but hot water. After continuing this diet until the stomach no longer sours, gradually enlarge the bill of fare until able to eat fruits and grains, simply prepared, avoiding tea, coffee, vegetables, spices, fat meats, preserves, sugar, and all foods hard to digest.

In six weeks the patient was well, and had added to his avoirdupois an average of one-half pound per diem.

An All-Gone Feeling.—"There is such a terrible, all-gone feeling at the stomach. I feel as though I wanted to eat all the time, and yet nothing satisfies me," said a fashionable lady patient one day.

"What do you eat?"

"Oh, beefsteak, bread and butter, tea and coffee, vegetables sometimes—whatever I like."

"Pickles?"

"Yes, always. I can't eat anything without pickles."

"Mustard on your meat?"

"Of course. If I don't eat mustard, meat always lies heavy on my stomach. It don't seem to digest."

"You take your coffee pretty strong, I suppose?"

"Yes, I want it good or not at all. None of your dish-water for me."

"You take ice-cream after dinner, sometimes, do you not?"

"Oh, yes, most every day in hot weather. No harm in that I suppose, it is so cooling."

"Don't eat anything between meals?"

"Yes, I do. I have fruit-cake or candy or something else good close at hand all the time, and eat whenever I get hungry."

"You eat considerable confectionery, then, do you?"

"Oh, not so very much. There is a five-pound box of peppermint drops over there my husband just sent me. That will last me almost a week."

"There are some more boxes over there just like this one. Do they contain peppermint drops too?"

"No; I have eaten those up. In the last five weeks I have eaten just twenty-three pounds of those peppermint drops. You don't think they will do me any harm, do you?"

"Oh, no! Peppermint oil applied to your skin, the tough outside covering of the body, will raise a blister; but a stomach that has been abused like yours probably has no more feeling than an old boot. I presume you could take half a pint of peppermint oil, and could eat mustard and red pepper like a Mexican, without knowing that there was anything unusual happening in your stomach, unless it were a little extra touch of 'all-goneness' an hour or two afterward. The trouble with your stomach, madam, is total depravity. It has been so abominably treated that its natural tone and vigor are 'all gone,' and it is of little more consequence to you than a leather bag.

"It is n't any wonder that your face is pale and haggard, your cheeks thin, your naturally fair skin covered all over with unsightly brown patches, and that you are so afflicted with general good-for-nothingness. Your blood is thin and poor for want of well-

digested food. Your nerves are irritated with exciting and irritating condiments, and your liver is half paralyzed by its frantic efforts to dispose of some of the wretched stuff you have been putting into your stomach. The wonder is you have not died of starvation, of spinal anæmia, or inflammation of the stomach, or winter cholera, or some other proper kind of punishment for your unnatural treatment of your digestive organs.

"If you expect to get well, you will have to turn over a new leaf immediately. Throw away your spices, condiments, confectionery, and ices, and stop eating between meals. Take only the most simple food twice or, at most, three times a day. You will soon find yourself getting more enjoyment out of a simple natural dietary than you ever dreamed of finding in the richest and most highly seasoned viands. You will have better blood; your system will make better brains and nerves, better muscles, and a better liver. The dingy brown hue will disappear from your skin, your eyes will resume their natural brightness, the horrid nasty taste will get out of your mouth, and the 'all-gone' feeling will be all gone."

She didn't like to give up her tidbits and peppermint drops, but she so longed to get rid of those ugly brown patches, which "French chalk" and "Magnolia balm" would not cover up, that she reformed; and although "a leper may not change his spots, nor the Ethiopian his skin," this fashionable woman changed hers.

Consumption or Dyspepsia, Which?—"Doctor," said the mother of a lad of seventeen, as she brought him into the office, "I want you to tell me if this boy

has consumption. He has been growing thinner and paler and weaker every day, until I have been obliged to take him out of school, and I am afraid he is n't going to be good for anything."

"Have a seat, madam, and I will look your boy over."

"Take off your coat and vest, sir,—shirt, also, if you please. Now stand up before the light here and let me see you breathe. Chest flat, shoulders round, lungs evidently rather weak. Have n't very good wind, I guess. How far can you run without getting all out of breath?"

"I can't run at all. Can't even walk very fast; it makes my heart beat so that it seems as though I could n't get my breath."

"Now let me listen at your chest with the stethoscope, while you take a deep breath. That will do. Now hold your breath a few seconds, while I listen at the heart. Very good. Now let us see your tongue. A thick yellow coat on it. You have a bad taste in your mouth in the morning?"

"An awful nasty taste."

"Have a good appetite?"

"Sometimes want to eat all the while, and other times can't eat at all."

"Have the headache sometimes?"

"Have sick headache every Monday morning."

"Have any bad feelings in your stomach?"

"It seems as if there was a big stone there after every time I eat."

"Bowels regular?"

"Have to take a dose of pills every other day, or they would n't be."

"Do you have any indigestion?"

"I don't know; but I have something that comes up into my mouth and scorches my throat worse than red pepper after almost every meal."

"What do you eat?"

"Oh, I eat most anything I like. I did n't suppose it made any difference what I ate."

"You like ham and eggs, fried sausage, 'Welsh rarebit,' mince-pies, doughnuts, griddle cakes, fried oysters, and stewed lobsters?"

"Oh, yes, I like all those things, and a good many more."

"Madam, it is plain that this boy has no consumption, but it is equally clear that he has a full-grown dyspepsia."

"Do you think so, Doctor?"

"It is perfectly evident, madam."

"Old Dr. M——, who examined him a few weeks ago, said that he was 'going into a decline,' and that I had better take him out of school, and give him a change of climate."

"He is already in a decline, madam. A change of climate won't do him any harm, but what he most needs is a change of diet."

"What do you think I had better give him to eat, Doctor?"

"Give him plenty of good fruit and grains, meat sparingly, eggs occasionally, and all the good rich milk and cream he wants."

"What sort of grain preparations do you think would be best for him?"

"Well, let him have oatmeal mush or cracked wheat

for breakfast, grits, rice, and boiled peas or beans for dinner, with good graham bread at both meals."

"But he don't like grains, Doctor."

"Very likely; but he must learn to like them."

"Do you think such light diet would be sufficiently strengthening for him? You know his blood is rather thin, and he is pretty weak. The other doctor said that I ought to give him very hearty food, as he needs to be built up; and he gave him some 'beef, wine, and iron tonic' to take."

"A light diet, do you say, madam? Why, one pound of oatmeal or cracked wheat is worth three pounds of beefsteak for nourishment, and is a good deal easier to digest than fried oysters, and those other abominations your son has been eating."

"But what about the supper, Doctor?"

"Well, if he must have a little supper, let him take a glass or two of milk, with a little stale bread and fruit; but his digestion is so slow, he will be a good deal better off without anything at night. His sleep will be sounder, and when he wakes in the morning, he will pretty soon be rid of that 'awful nasty taste' in his mouth, and have a better appetite for breakfast. Try my prescription, and before a month's time you will be convinced that it is a good one."

The prescription was tried, not one month, but six months—a year, in fact; and now the pale, weak lad has grown to be a tall, broad shouldered, muscular young man, with stout lungs, good digestion, and no more indications of an approaching decline than a growing pumpkin.

BILIOUSNESS.

"IF you can only get this bile off my stomach, Doctor, I think you can cure me," said a young man who had come from another State for advice regarding his health.

What makes you think there is bile on your stomach, sir?

"Because I feel so bilious all the time. When I get up in the morning, my head feels as though it were made of wood. My mouth tastes as though I had been chewing old brass, and it takes me two or three hours to get my brain waked up enough so I can begin to think straight. My bowels are so costive I have to drink a bottle of vile mineral water every morning and night of my life, or they never would move. My skin, which used to be as fair as a girl's, is as dingy as though I never took a bath in my life. I see black specks before my eyes nearly all the time, and every little while get so dizzy-headed I can hardly walk. Now if this does not show that there is too much bile on my stomach, then what does it indicate?"

"Too much bile," did you say? My dear fellow, the trouble is you have not bile enough. There is no bile at all on your stomach. If you had bile on your stomach,

you would n't be here. You would be at home laid up in bed, patronizing a cuspidor, and sending out for a doctor to come and stop your turning yourself inside out. When bile gets on the stomach, it do n't stop there; it either goes up or down very suddenly. The stomach knows its business too well to allow bile to lie around loose in it for weeks and months, or for any length of time.

"But I vomit bile sometimes."

Certainly. And if you had bile on your stomach, you would be vomiting this minute, as I have just intimated. But the bile very rarely gets into the stomach unless a person is nauseated so that the intestines get to working the wrong way, and carry the bile up from the place where it enters the small intestine, a few inches below the stomach, into the stomach itself.

"Well, I believe that is what is the matter with me. It seems as though things had been working the wrong way down there for six months back, and one day I am sure there was bile on my stomach. I was awful sick, and sent for the doctor; and when he came, he gave me a dose of ipecac, and I vomited and vomited and vomited till I believe everything I had eaten for a week came up, and then came along a lot of bile as black and bitter as tan bark. I felt better for several days; and then it seemed to me as though the bile began to accumulate again, and I have been feeling worse ever since. I believe if you would give me a good emetic, I should feel better right away."

No, you would n't. You would feel worse immediately, though you would probably feel better after the skirmish was over; but I am not prepared to see all

you have been eating for a week just at present, so I guess we will postpone the emetic if you please.

"But about that bile?"

You have not convinced me yet that there is any bile on your stomach to be moved off, as you seem to believe. When a man gets to vomiting, and everything gets to working up toward the mouth, the bile is raised from the small intestine to the stomach by the violent efforts made in retching, or vomiting, while at the beginning of the attack there may have been none at all in the stomach.

What is Biliousness?—Biliousness is a condition of the system in which there is too little bile produced, instead of too much. The waste elements, which ought to be removed from the blood by the liver in the form of bile, are left in the body, and accumulate in the tissues. It is this that gives the dingy color to the white of the eye, the dirty hue to the skin, and the coppery taste to the mouth, and which produces the giddiness, the floating specks before the eyes, and the general feeling of languor and discomfort which characterizes the condition commonly known as biliousness. This dingy hue of the skin is actually due to the accumulation of waste matter, or organic dirt. The skin is dirty, perhaps not upon the surface, but all through its structure. Not only the skin, but the muscles are dirty. The brain and nerves are dirty. The whole body is clogged with dead and poisonous particles which ought to have been promptly carried out of it, but have been retained on account of the inefficient action of the liver.

Too Much Bile.—"But don't you think it is possible, Doctor, for a person to have too much bile?"

It may be possible, but is scarcely probable. Did you ever know of a person's having too much gastric juice or too much pancreatic fluid? But if it were possible, such a condition would not be likely to produce any of the symptoms which accompany biliousness.

"Very likely you are right, Doctor; but I would really like to know what causes this horrible biliousness that makes a man get up feeling as though he was going to be shot, or had committed the unpardonable sin, or that some horrible calamity was about to befall him."

Causes of Biliousness.—The causes of biliousness are various. One of the most frequent is overeating. If you press your fingers close up under the ribs on the right side of the body, you can feel the lower border of the liver about an inch above the lower edge of the last rib. If you do the same after having eaten a hearty meal, you will find the lower border of the liver half an inch lower down. This is due to the fact that the liver becomes enlarged through the absorption of digested food after a meal has been taken. If you eat a very large meal, say twice as much as you usually eat, and then feel for the lower border, you will find it reaching down to a level with the lowest rib, showing that the liver is very greatly enlarged, much more than it should be. If you go on eating too much in this way, day after day and week after week, after awhile the vessels of the liver will be so relaxed by frequent distension that the organ will grow permanently enlarged and congested. When in this condition, the liver cannot make bile readily, and so does not do the proper amount of work, and the waste elements which it ought to remove from the body are left to accumulate in the tissues, and all the symptoms of biliousness follow.

Biliousness is sometimes the result of eating too freely of fats. Animal fats being particularly difficult to digest, and likely to be taken in too large quantities in the shape of butter, lard, suet, and fat meats, are apt to produce this condition.

Some years ago, a French physiologist fed to various animals liberal supplies of fat, and then observed the quantity of bile produced. He found that the amount of bile was lessened just in proportion to the amount of fat added to the food. In order to ascertain the reason for this result, he killed some animals, after having fed them freely with fat, and examined their livers with a microscope. By this means he discovered that the little cells which chiefly compose the liver, and which form the bile, were crowded full of little drops of fat, and were thus so burdened and hampered in their work that they were obliged to work very slowly, and hence produced only a small quantity of bile.

Similar experiments show that the excessive use of flesh food also renders the liver torpid, and produces biliousness. Flesh food generally consists of albumen, a nitrogenous substance, which can be used in the body only in a very limited amount. The average person can use only three ounces of this kind of material each twenty-four hours. Now if a person eats several times this amount in the form of beefsteak, mutton-chop, or any other flesh food, the superfluous amount must all be removed in the form of waste matter. That is, if the person eats meat sufficient to supply four ounces of nitrogenous matter, the extra ounce must be carried off by the kidneys in the form of urea, or uric acid, and this must be acted upon by the liver to prepare it for re-

moval by the kidneys. If the liver has more of this work to do than it should have, the work will be imperfectly done, and much waste matter which ought to be removed will be left in the system, producing biliousness, rheumatism, muscular pains, sick headaches, and many other uncomfortable symptoms. Persons suffering from these causes will often notice sediment in the urinary secretion. This is, in fact, one of the most common causes of the sediment, or deposit, ordinarily found in the urine.

Cause of Spring Sickness.—"Doctor, do you suppose the facts you have stated respecting fats and flesh food explain the reason why one loses his appetite for such substances, and craves fresh vegetables, acids, etc., in the spring of the year?"

Certainly, sir. The repugnance to rich foods and flesh food, which nearly every person feels in the spring, is nature's protest against the use of those articles at that season of the year. During the winter season, the extra supply of oxygen received in the condensed atmosphere enables the system to dispose of waste matters more readily than during the warm season; and hence those substances which tax the liver and encourage the accumulation of waste matter, can be taken with greater impunity during the cold months; but when warm weather approaches, the accumulation of waste matter soon becomes so great that nature makes a vigorous demand for a change of habits in the matter of diet. If nature's suggestion is not readily received and acted upon, she follows it up with a vigorous reminder in the shape of a "bilious attack," "spring sickness," a "gastric fever," an attack of "liver

complaint," diarrhea, or some other expression of her displeasure at the treatment she receives.

Still another cause of biliousness, arising from torpidity or inactivity of the liver, is the use of condiments and such substances as mustard, pepper, pepper-sauce, ginger, Worcestershire sauce, vinegar, and other things which have an acrid or burning flavor. How any one could ever have learned to relish substances which burn and sting as they go down the throat, is one of the mysteries of dietetics which we have never been able to solve. Certain it is that a substance which will raise a blister on the skin in fifteen minutes, as mustard or cayenne pepper will do, is capable of doing mischief on the inside of the liver when it gets there through absorption from the stomach. If you put a little pepper in the eye, it makes the tears flow, and presently the eye becomes blood-shot. Mustard or pepper in the liver does not make it smart, as it has very few nerves of feeling; but it causes the blood-vessels to enlarge, and probably at first increases the amount of bile produced; but the effect of continued use is just the same as would be the effect upon the eye, if a little pepper were put into it every day. Such an eye would after awhile become so inflamed that it would be blood-shot and congested all the time. So the liver, by the habitual use of condiments, becomes permanently congested; and a congested liver is a torpid liver, capable of making less bile than is necessary to maintain the system in a state of health.

"But, Doctor, food is so insipid without any seasoning. You don't really think a little mustard on meat, or pepper in soups and on vegetables, does any particular

harm, do you? It seems to me that I feel better when I add a little pepper or mustard to my food. If I don't have it, food seems to lie heavy on my stomach."

Evidently, your poor stomach has got so used to being whipped, it won't work without whipping, like a lazy horse that has become so accustomed to the lash that it does not know it is required to take a faster gait until the whip is applied vigorously. And your poor liver is doubtless just as sluggish as your stomach, only it has been whipped so long and has become so weak from trying to do all the extra work demanded of it, that it won't work at all, even if it is whipped with mustard, pepper, pepper-sauce, and the other means by which people goad their stomachs and livers into doing more work than they are really able to do. I suppose you take a dose of salts now and then, and feel better right away afterward, don't you?

"Yes, that is just what I do. I was brought up on salts. As early as I can remember, my mother gave me a dose of salts along with the rest of the children every two weeks regularly; but lately my liver has been getting so torpid the salts do not seem to touch it, and I have to go to the doctor and get a dose of calomel every now and then."

That is about the way most people do. After they have whipped and goaded their livers until they have become so tired and weak they will not respond to any ordinary whipping, then they run to the doctor for some cat-o'-nine-tails sort of medicine with which to exasperate the poor organ into doing what it is really too weak and feeble to do.

But there is still another cause of biliousness which

is quite frequently overlooked. The liver needs oxygen to carry on its business of bile-making and sugar-making and the various other kinds of work it has to do. The amount of oxygen in the blood depends upon the amount of air taken into the lungs. If a man stops breathing, he very quickly gets black in the face, because the oxygen of the blood is consumed so rapidly that the blood quickly acquires the dark color it has when it contains little or no oxygen. If we exercise out-of-doors on a cold winter's day, we come in with cheeks and lips rosy with the glow of health, because they are filled with bright blood, rich in oxygen. When we sit quietly in-doors in heated rooms, and take little or no exercise out-of-doors, we do not expand our lungs well, and consequently receive very little air into the blood, and the little we inhale is poor in oxygen. Consequently, the whole body suffers for want of this life-giving element, and the liver with the rest. Not being able to make bile without oxygen, and its supply being insufficient, it makes too little bile, and allows the waste elements which should have been removed through this channel to accumulate in the body. Thus a person becomes bilious from sedentary habits.

We must not overlook the fact that the use of strong tea and coffee, and especially the use of tobacco and alcoholic drinks, are among the most ready means of producing biliousness. All smokers and drinkers are more or less bilious, and the tawny complexion of strong tea and coffee drinkers is undoubtedly due to the bad effect of these beverages upon the liver.

No Wonder He Was Bilious.—"Well, Doctor, if what you have been telling me is true, and I confess it

looks reasonable, as you seem to have good scientific facts for the support of all your theories, I do not wonder that I am bilious; for I think I have done everything I possibly could to make myself so. Mother is a good cook, and it always seems to do her good to see us eat heartily; and a good many times, when I feel as though I had eaten enough, she brings along some nice short-cake, or chicken pie, or an apple dumpling with cream sauce, or some other nice dish, and the temptation is almost always too much for me. I presume I eat as much again as I ought to. I know I do, in fact. One day I weighed myself, and found that I weighed almost four pounds more after dinner than I did before. When I think of it, I wonder my liver did n't swell up big enough to burst.

"As for fats, I believe I eat a quarter of a pound of butter every meal. Our family is consumptive, you know, and the doctor told mother she ought to make us eat all the fat we could, so we would n't get consumption; and I eat meat three times a day, ham and eggs or beefsteak for breakfast, roast beef or stewed chicken for dinner, and tongue or some other cold meat for supper, and sometimes I take a sandwich just before I go to bed, when I get home rather late. Why, I supposed meat was healthful, and that one could n't be strong unless they ate plenty of it. I never heard about its having anything to do with the liver before; but then, it is just as you say, I have no doubt; for I have often noticed that brick-dust sediment, which you referred to. But I have observed, too, that it sometimes disappears, when I happen to get out of the store for a few days, and take more exercise in the open air.

"But now won't you tell me how I am going to get rid of this bad taste in my mouth, this yellow coat on my tongue, and these unsightly pimples on my face? And, besides, I want to call your attention to the worst of all, those horrid 'down feelings' I have in the morning, when I first get up, and two or three hours afterward."

Remedy for Biliousness.—The remedy is plain enough. Stop abusing your liver. Give it an easy time for a few weeks, and see what a wonderful change will occur in your feelings. The liver will go about its work in the most cheerful manner possible if it has half a chance.

To begin with, stop eating fat, meat, and sugar. There, I forgot to tell you about sugar. I suppose you want to know the reason it makes one bilious when used in too large quantities. Well, the liver, as you doubtless know, has a funny trick of taking all the sugar that comes to it in the digested food,—which is quite a large amount, as all the starch of our food is converted into sugar in the digestive process,—and converting it into a sort of liver starch, called *glycogen*. This starch it stores away in its tissues, and this, by the way, is one reason why the liver is larger after a meal than before; it is filled up with liver-starch. In the interval between one meal and the next, this liver-starch is slowly converted into sugar again, and allowed to enter the system, a little at a time. Now if a person eats too much sugar, the liver will have more of this starch-making business than it can do, without neglecting other work, and consequently will get behindhand with its bile-making. So a person who eats too much butter, sugar, confectionery,

etc., gets the "blues," and has to pay smartly for his indulgence of his sugar tooth.

But to resume our prescription. Abstain from animal fats, flesh meats, sugars and sweet sauces, pastry, rich foods of all sorts, spices and other condiments. Be careful not to eat too much. Let the diet consist chiefly of fruits and grains, with a liberal allowance of milk. Take one or two oranges half an hour before each meal. A lemon now and then, or a glass of lemonade, either cool—not cold—or hot, according to your fancy, and taken some other time than at meals or just after eating, will be found serviceable. One hour before each meal, drink two glasses of hot water, hot as you can swallow without inconvenience. Repeat the dose half an hour before going to bed at night.

On retiring, wring a towel out of cold water, dry enough so it will not drip, and place it around the body over the liver, and cover with two or three thicknesses of dry flannel. In the morning, remove the bandage, and dipping the hands in cold water, rub the surface, and then dry it with a linen towel. Beat the chest vigorously over the region of the liver for five minutes. Rub and knead the bowels for another five minutes. Every other morning, take a hand bath, using water at a temperature of seventy-five to eighty degrees, just dipping the hands in the water, then rubbing the surface of one part of the body at a time, drying the part immediately, before proceeding to another part, and so bathing the whole body. Be sure to get up a good glow.

Every day walk five miles in the open air, with the shoulders well thrown back, head erect, and with a vigorous step. Do n't try to do much of it before breakfast;

one mile at that time is enough. Divide the balance between the forenoon or afternoon and the evening, just before going to bed. If you can bring yourself to adopt the plan of eating but twice a day, your poor, tired liver would be very grateful for the little vacation which you would give it between the last meal and the first meal the next day. This will give it time to contract down to its proper size, to empty itself of blood, and clear away all the old liver-starch it has been storing up, and to get a good store of bile ready to help digest the next meal, and at the same time clear away the dirt from the brain and the rest of the body. Dispensing with the third meal will do more in getting rid of the morning "blue devils" than anything else can do.

"But, Doctor, I don't see how I am going to do all that. I always did like good victuals, and I had so much oatmeal and that sort of stuff at boarding school that I never could bear it since. Don't you think you could give me something I could take that would cleanse my blood and stir my liver up, in place of this diet, and bathing, etc. And besides, I don't see how I can get the time for that five-mile walk. I don't believe I have walked five miles in one day in as many years."

I see you are just like most other sick people. You want us doctors to help you to find out some way of cheating nature. You want to do as you please, gratifying a depraved appetite, neglecting all hygienic rules, violating the laws of nature as much as you please, and then ask us to give you some little drops of medicine which you can swallow and undo the consequences of all this physical sinning. Let me tell you, young man, nature was not such a fool as to make laws with penal-

ties attached, and then provide easy ways for avoiding proper punishment for their violation. What would you think of a government that would make a law requiring imprisonment for theft, and then place in the hands of each culprit, as he was turned into his cell and locked up, a key by which he could unlock the prison door and let himself out any moment he chose to do so?

Nature says, "If you gorge yourself with flesh food, if you swallow all sorts of greasy diet, if you apply mustard poultices to the inside of your stomach, if you make a hog and a glutton of yourself generally, and then sit down in an oven of an office all day, and smoke or drink beer with a lot of other silly fellows at the 'Club' at night, and habitually commit all sorts of other 'unnatural crimes' against your stomach and your liver,—if you behave in this sort of indecent way, you shall be condemned to suffer 'biliousness' to the full extent of the law, and all the medical lawyers and pettifoggers in Christendom, regular and irregular, allopathic, homeopathic, electropathic, physiopathic, motorpathic, and those of no pathy at all, can't save you from the dismal dungeon of misanthropy and hypochondriasis into which I will plunge you if you don't speedily turn over a new leaf, and begin works of supererogation, such as swallowing a few pints of hot water every day to rinse your dirty blood and brain and muscles, and wash the old bile out of your liver and gall-bladder, and help to drive the wheels of your bile-making factory fast enough to make up for lost time. Why, young man, let me tell you something that perhaps you don't know. You are liable to be arrested any minute, and condemned to the torture bed of inflammatory rheumatism, which means six weeks

of purgatory, lacking nothing but the brimstone to make it equivalent to the orthodox place of the same name."

"Well, well, I see it is n't hardly safe for a fellow to fool with his liver too much. I will try your prescription, but I do n't hardly know about that hot water. Would it do any harm if I should put in a teaspoonful or two of brandy to make it go down better?"

Not a drop, sir. A teaspoonful of brandy would be just enough to antidote all its good effects upon the liver. You must take your water "straight."

"You will allow me to take mineral water if I prefer, won't you, Doctor? You know there is a good deal said nowadays about germs, etc., in drinking water, and the danger of poisoning from lead pipes, etc.; and besides, hot water is so flat. I do n't believe I have taken a glass of water without 'something in it' for six months."

Sorry I cannot accommodate you, sir, but I never prescribe mineral water. When we take water for medicine, it is water we want, and not minerals; and as to purity, a man of your intelligence and general information ought to know that most of the mineral waters come from the city water-works, with all their possible germs and a lot of other things, the original water being adulterated with various alkalies, salts, sulphurous gases, and other bad tasting and filthy smelling things, and then bottled and labeled as though it came direct from the bowels of the earth, although it is very likely that it would not be any better if it did.

"Well, Doctor, if I must, I must. I will follow your prescription for six weeks, and then if I am no better I shall say that I am a fool, and you are a ———"

Never mind, sir. At the end of six weeks you will say that you were a fool, but are growing wiser, and that I am your benefactor. I will stake my reputation that if you follow my prescription to the letter, you will never have occasion again to ask me or any other doctor to "get the bile off your stomach."

The Two Breaths.

THE air which we breathe in, is the "breath of life;" the air which we breathe out, is a deadly vapor, destructive to animal life in every form. It is very important that we should truly understand the nature of the two breaths, and the important relations which they sustain to human life and health. Let us consider, first, the breath we breathe in.

The Air.—The chemist tells us that the atmosphere consists chiefly of two gases, oxygen and nitrogen, in the proportion of one part of the former to four of the latter. Of these two gases, oxygen is the one which is essential to life. Nitrogen seems to be useful only to dilute the oxygen, and regulate its supply to the body. Some other things are found in the air, such as dust and other foreign bodies; but the most worthy of mention is carbonic acid, a poisonous gas which is found in the purest air in the proportion of one part to twenty-five hundred of air. All animal and vegetable life depend upon the oxygen of the air. Combustion, or burning, and many other chemical processes also depend upon the presence of oxygen. If this gas is diminished in proportion, even so small an amount as two or three parts in a hundred,

the breathing becomes difficult, and a lighted taper or candle burns dimly. A slight additional decrease in the amount of oxygen renders the air incapable of supporting combustion, so that burning bodies, as a candle, thrown into it would be extinguished.

The intensity of our life, or vital activities, is largely dependent upon the amount of oxygen in the air, which is constantly varying, more or less, as the result of various causes, some of which we will mention:—

When the air is heated, it expands, thus giving to any given volume of air a diminished amount of oxygen. Air which is heated from twenty degrees above zero to the usual temperature of living-rooms, increases its volume one-tenth, and proportionately diminishes the amount of oxygen contained in a given volume. Air at ninety degrees contains one-twentieth less oxygen than the same amount of air at sixty degrees. This is the reason why the fire on the hearth burns more brightly in cold weather than in warm, and why a brisk walk on a frosty morning produces such a fine flow of animal spirits, and a vigorous appetite. Each breath of the cold, condensed air carries into the lungs a larger amount of the life-giving oxygen than is breathed during the warm days of midsummer, when the air is expanded and the oxygen diluted by the heat.

The density of the air, and consequently the proportion of oxygen which it contains, is also diminished by altitude. The air at the mountain top is thinner than that in the valley, as the atmospheric pressure is less. One who has climbed among the Alps or the mountains of Colorado has been made conscious of this fact by the difficulty experienced in making exertion

after getting up a few thousand feet, where the air is much thinner than that which he has been accustomed to breathe, requiring an extra effort to get a sufficient amount of air to supply the wants of the system.

The barometer indicates a constant variation in the density of the atmosphere. When the barometer rises, the air is denser, and consequently richer in oxygen. When it falls, the air is lighter, and contains less oxygen. This fact accounts for the enervation and oppression often felt just prior to and during a storm, when the barometer usually falls, owing to the decrease in the density of the atmosphere.

It will be readily understood that a sudden rise in temperature accompanied by a fall of the barometer, would produce a double degree of interference with respiration, by decreasing the amount of oxygen inhaled at each breath. The amount of oxygen taken in at a single respiration, with the thermometer at 80° and the barometer an inch and a half lower than usual, would be equivalent to only nine-tenths of the amount of oxygen taken with the barometer at its usual hight and the temperature at 60°. This very readily accounts for the extreme degree of enervation and prostration felt, especially by nervous people and invalids, just prior to a storm, in very hot weather.

Persons living in an elevated atmosphere compensate for the diminished amount of oxygen in the air by increasing the amount taken in at each respiration. This is said to result in increasing the lung capacity of people residing in such localities. It is also supposed that the necessity for increased action of the lungs and the breathing of a larger amount of air, is the means by

which persons suffering with some forms of pulmonary disease are apparently benefited by residence in elevated districts.

The air of countries located near the sea or other large bodies of water, contains a large proportion of watery vapor when the wind is in the direction of the water. When the wind is blowing in the opposite direction, the air is apt to be quite dry. Just before a storm, the air is usually nearly saturated with vapor. In the warm season of the year, the degree of saturation of out-door air and that within doors is about the same. In the winter season, however, owing to the high temperature of in-door air, it is very much drier, unless watery vapor is added by artificial means, which should always be done. This is owing to the fact that air acquires, by increase of temperature, a greater capacity for absorbing moisture.

The Air We Breathe Out.—During its stay in the lungs, the air acquires properties of a deadly character, which may be easily determined by a few experiments:—

Experiment.—Place a few flies in a bottle. Now breathe into it until all the air of the bottle is displaced by air from the lungs. Now cork the bottle, and in a little while the flies will be dead.

Another Experiment.—By means of a tube, breathe several times into a fruit jar. Now take a small bit of candle, and fasten it to one end of a wire twelve or fifteen inches long. Light it, and let it down into the jar. It will be quickly extinguished. Thousands of human lives are being extinguished at this very moment by breathing air which has been breathed before.

By means of another experiment, the chemist learns

that the expired breath contains a larger amount of carbonic acid gas than ordinary air. Put half a teacupful of lime-water into a clean quart fruit jar. Close the mouth of the jar, and shake it. The water remains clear. Now blow into the jar through a tube, three of four breaths. Close the jar. Shake again. Observe that the water becomes a milky color. This proves that the breath contains a large amount of carbonic acid gas, and explains the reason why a candle will not burn in air which has been breathed.

The Black Hole of Calcutta.—The deadly properties of breathed air are well illustrated by the dreadful experiences of a company of English soldiers in a prison in India, something more than a century ago. The following account of the terrible suffering and fatal effects produced in this instance by deprival of fresh air, given by Mr. Holwell, one of the sufferers, though somewhat lengthy, teaches us such a lesson of the value of pure air that we consider it worthy a place in these pages :—

"Figure to yourself the situation of a hundred and forty-six wretches, exhausted by continual fatigue and action, crammed together in a cube of eighteen feet, in a close, sultry night in Bengal, shut up to the eastward and southward (the only quarter whence air could reach us) by dead walls, and by a wall and door to the north, open only to the westward by two windows strongly barred with iron, from which we could receive scarcely the least circulation of the fresh air. . . . We had been but a few minutes confined before every one fell into a perspiration so profuse you can form no idea of it. This brought on raging thirst, which increased in proportion as the body was drained of its moisture. Various

expedients were thought of to give more room and air. To gain the former, it was moved to put off their clothes; this was approved as a happy motion, and in a few moments every one was stripped, myself, Mr. Court, and the two young gentlemen by me, excepted. For a little while they flattered themselves with having gained a mighty advantage; every hat was put in motion to gain a circulation of air, and Mr. Baillie proposed that every man should sit down on his hams. This expedient was several times put in practice, and at each time many of the poor creatures, whose natural strength was less than that of the others, or who had been more exhausted, and could not immediately recover their legs when the word was given to rise, fell to rise no more, for they were instantly trod to death or suffocated. When the whole body sat down, they were so closely wedged together that they were obliged to use many efforts before they could get up again. Before nine o'clock, every man's thirst grew intolerable, and respiration difficult. Efforts were made to force the door, but in vain. Many insults were used to the guard to provoke them to fire on us. For my own part, I hitherto felt little pain or uneasiness but what resulted from my anxiety for the sufferings of those within. By keeping my face close between two of the bars, I obtained air enough to give my lungs easy play, though my perspiration was excessive, and thirst commencing. At this period, so strong a urinous volatile effluvium came from the prison, that I was not able to turn my head that way for more than a few seconds at a time.

"Now everybody, except those situated in and near the windows, began to grow outrageous, and many

delirious. *Water! water!* became the general cry. An old Jemandtdaar, taking pity on us, ordered the people to bring us some skins of water. This was what I dreaded. I foresaw it would prove the ruin of the small chance left us, and essayed many times to speak to him privately to forbid its being brought; but the clamor was so loud it became impossible. The water appeared. Words cannot paint the universal agitation and raving the sight of it threw us into. I flattered myself that some, by preserving an equal temper of mind, might outlive the night; but now the reflection which gave me the greatest pain was that I saw no possibility of one's escaping to tell the dismal tale. Until the water came, I had not myself suffered much from thirst, which instantly grew excessive. We had no means of conveying it into the prison but by hats forced through the bars; and thus myself and Coles and Scott supplied them as fast as possible. But those who have experienced intense thirst, or are acquainted with the cause and nature of this appetite, will be sufficiently sensible that it could receive no more than a momentary alleviation; the cause still existed.

"Though we brought full hats through the bars, there ensued such violent struggles and frequent contests to get it, that before it reached the lips of any one, there would be scarcely a small teacupful left in them. These supplies, like sprinkling water on fire, only seemed to feed the flames. Oh! my dear sir, how shall I give you a just conception of what I felt at the cries and cravings of those in the remoter parts of the prison, who could not entertain a probable hope of obtaining a drop, yet could not divest themselves of expectation, however

unavailing, calling on me by the tender considerations of affection and friendship. The confusion now became general and horrid. Several quitted the other window (the only chance they had for life) to force their way to the water, and the throng and press upon the window was beyond bearing; many, forcing their way from the farther part of the room, pressed down those in their passage who had less strength, and trampled them to death.

"From about nine to eleven I sustained this cruel scene, still supplying them with water, though my legs were almost broken with the weight against them. By this time I myself was near pressed to death, and my two companions, with Mr. Parker, who had forced himself to the window, were really so. At last I became so pressed and wedged up, I was deprived of all motion. Determined to give up everything, I called to them, as a last instance of their regard, that they would relieve the pressure upon me, and permit me to retire out of the window to die in quiet. They gave way, and with much difficulty I forced a passage into the center of the prison, where the throng was less by the many dead, amounting to one-third, and the numbers who flocked to the windows; for by this time they had water also at the other window. . . . I laid myself down on some of the dead, and recommending myself to Heaven, had the comfort of thinking my sufferings could have no long duration.

"My thirst now grew insupportable, and the difficulty of breathing much increased. I had not remained in this situation ten minutes before I was seized with a pain in my breast, and palpitation of the heart, both to the most exquisite degree. These obliged me

to get up again, but still the pain, palpitation, and difficulty of breathing increased. I retained my senses notwithstanding, and had the grief to see death not so near me as I had hoped, but could no longer bear the pains I suffered without attempting a relief, which I knew fresh air only would and could give me. I instantly determined to push for the window opposite to me, and by an effort of double the strength I ever before possessed, gained the third rank at it—with one hand seized a bar, and by that means gained a second, though I think there were at least six or seven ranks between me and the window. In a few moments the pain, palpitation, and difficulty of breathing ceased, but the thirst continued intolerable. I called aloud, '*Water for God's sake!*'

"I had been concluded dead; but as soon as the men found me among them, they still had the respect and tenderness for me to cry out, '*Give him water!*' nor would one of them at the window attempt to touch it till I had drunk. But from the water I had no relief; my thirst was rather increased by it: so I determined to drink no more, but patiently await the event. I kept my mouth moist from time to time by sucking the perspiration out of my shirt sleeves, and catching the drops as they fell like heavy rain from my head and face; you can scarcely imagine how unhappy I was if any of them escaped my mouth. . . . I was observed by one of my companions on the right in the expedient of allaying my thirst by sucking my shirt sleeve. He took the hint, and robbed me from time to time of a considerable part of my store, though, after I detected him, I had the address to begin on that sleeve first when I thought my

reservoirs were sufficiently replenished, and our mouths and noses often came in contact. This man was one of the few who escaped death, and he has since paid me the compliment of assuring me he believed he owed his life to the many comfortable draughts he had from my sleeves. No Bristol water could be more soft or pleasant than what arose from perspiration.

"By half-past eleven, much the greater number of those living were in an outrageous delirium, and others quite ungovernable, few retaining any calmness but the ranks near the windows. They now all found that water, instead of relieving their uneasiness, rather hightened it, and 'Air! air!' was the general cry. Every insult that could be devised against the guard was repeated to provoke them to fire on us, every man that could, rushing tumultuously toward the windows with eager hopes of meeting the first shot. But these failing, they whose strength and spirits were quite exhausted, laid themselves down, and quietly expired upon their fellows; others, who had yet some strength and vigor left, made a last effort for the windows, and several succeeded, by leaping and scrambling over the backs and heads of those in the first ranks, in getting hold of the bars, from which there was no removing them. Many to the right and left sank with the violent pressure, and were soon suffocated; for now a steam arose from the living and the dead, which affected us in all its circumstances, as if we were forcibly held by our heads over a bowl of strong volatile spirits of hartshorn until suffocated; nor could the effluvium of the one be distinguished from that of the other.

"I need not ask your commiseration when I tell you

that in this plight, from half an hour after eleven till two in the morning, I sustained the weight of a heavy man with his knees on my back, and the pressure of his whole body on my head; a Dutch sergeant who had taken his seat on my left shoulder; and a black soldier bearing on my right,—all of which nothing would have enabled me to support but the props and pressure equally sustaining me all round. The two latter I frequently dislodged by shifting my hold on the bars, and driving my knuckles into their ribs; but my friend above stuck fast, and as he held by two bars, was immovable. The repeated trials I made to dislodge this insufferable encumbrance upon me, at last quite exhausted me, and toward two o'clock, finding I must quit the window or sink where I was, I resolved on the former, having borne truly, for the sake of others, infinitely more for life than the best of it is worth.

"I was at this time sensible of no pain and little uneasiness. I found a stupor coming on apace, and laid myself down by that gallant old man, the reverend Jervas Bellamy, who lay dead with his son, the lieutenant, hand in hand, near the southernmost wall of the prison. Of what passed in the interval, to the time of resurrection from this hole of horrors, I can give you no account."

At six in the morning the door was opened, when only twenty-three out of the hundred and forty-six still breathed. These were subsequently revived.

Numerous other instances, similar in character, have occurred on slave and emigrant ships, in which large numbers of persons have been confined in unventilated cabins during severe storms. In one instance, one-

third of a company of two hundred emigrants thus confined were found dead when the hatchways were burst open, and the remainder were barely alive.

But these cases only give a mere suggestion of the dreadful mortality from impure air. Probably there is not one private house in a thousand which has an adequate supply of pure air during the cold season of the year. It is only by being long habituated to the poisonous influences of impure air, that civilized people are able to withstand its poisonous influences. A North American Indian, accustomed to the pure atmosphere of his native wilds, would scarcely survive six months' confinement during the winter season in an average American home. Thousands of soldiers, on returning home after several years of camp experience, have found it difficult to endure the confinement of living-rooms, with which they had formerly been wholly content.

Dirty Air.—The general apathy as to the necessity for pure air is simply appalling. A person who would not think of wearing a soiled or cast-off garment which had been worn by another person, will sit in a crowded church or lecture hall, breathing over and over again, with entire complacency, air which has been soiled by transit through other peoples' mouths and lungs and noses many times over. Pure air is the most essential of all the necessaries of life; and a knowledge of how to secure an abundant supply in every home should be considered an essential part of the education of every young man. The following summary of the principles of ventilation are quoted from another work* by the author:—

* Home Hand-Book of Domestic Hygiene and Rational Medicine.

How to Ventilate a Home.—In the construction of a dwelling, attention should be given to ample provision for an adequate supply of fresh and pure air. It should be recollected that each person requires not less than from forty to sixty cubic feet of pure, fresh air per minute, or 2,400 to 3,600 cubic feet per hour. To secure this amount of air, requires for each person an opening not less than one-sixth of a square foot in area, and absolute safety requires a still larger area. Some fresh air will find its way in through cracks between the window-sashes, under and around doors, and even through brick walls; but this is an uncertain and inadequate supply, and openings should be provided at convenient places for this purpose.

If provision for the proper ventilation of a house is made at the time of its construction, very little expense need be incurred; hence the importance of giving this matter attention when planning a dwelling. The following is a brief summary of the principles of correct ventilation, which ought to be familiar to every one whether interested in house-building or not:—

1. For efficient ventilation of each room in the building, two openings are necessary, one for the entrance of fresh air, and one for the egress of foul air.

2. When the fresh air enters a room warm, as when furnaces are used for heating, the foul-air opening should be at the bottom, as the oldest air in the room, and consequently the most impure, will be that which has been in the room the longest, and has been gradually cooled by contact with outside walls and window surfaces. When a room is heated by stoves, the foul-air opening should be near the ceiling.

3. The size of the openings depends upon the number of persons to be supplied with air. It may be laid down as a general rule that an opening twenty-four inches square in both inlet and outlet is required for each individual in a room. The opening should be of sufficient size to allow a passage of at least three thousand cubic feet of air per hour, without creating too perceptible drafts. Air cannot travel through a room more rapidly than five feet a second without a current being perceptible. A sick-room needs two or three times the ordinary amount of ventilation.

4. The foul-air openings of rooms should connect with heated ventilating shafts. Cold-air shafts are uncertain ventilators. They are not to be relied upon. The amount of draft in the shaft depends upon the hight of the shaft and the amount of heat in it. Various methods of heating the ventilating shaft may be adopted. In a building heated by steam, steam pipes may be employed. In ordinary dwellings, the waste heat of smoke-pipes or chimneys may be utilized for the purpose. An oil-stove or a gas-jet may be used for heating small shafts in dwellings; or a small stove may be used to accomplish the same purpose in larger shafts.

5. Rooms on different stories should not open into the same ventilating shaft, as the upper rooms are certain, under various circumstances, to receive the foul air from the rooms below.

How to Test the Air.—The air of a room may be tested as to its purity by the following simple method, which is quoted from the same work:—

The materials required to perform the test are a sup-

ply of perfectly clear, saturated lime-water and four bottles or jars of different sizes, the sizes required being the following: One jar or bottle capable of holding exactly sixteen ounces, or one pint; a second holding ten and one-half ounces; a third holding eight ounces or one-half pint; and a fourth capable of holding six and one-half ounces. The jars should have necks large enough to admit of perfect cleaning of the whole inside, and the greatest pains should be taken to remove every particle of dirt or dust from the inside as well as the outside, with water. To apply the test, fill the jar with the water to be tested. This may be done either by drawing the air out of the bottle through a straw or tube, or by filling it with pure water, and letting the water escape. Great care should be taken in sucking the air out of the bottle, that the breath is not allowed to enter. To determine the amount of carbonic acid present, use the smallest jar first. After filling it in the manner described, pour in a large tablespoonful of clear lime-water. Close the mouth with a clean stopper, and shake vigorously for a minute or two. If the lime-water becomes cloudy, carbonic acid is present in the air in the proportion of ten parts to ten thousand. If it does not become cloudy, repeat the experiment with the next size, or the half-pint jar. If the lime-water becomes cloudy in this, the proportion of carbonic acid is eight parts in ten thousand. This proportion may often be found in the rooms of dwelling-houses, and sometimes in crowded streets and narrow alleys. If the lime-water does not become cloudy in a jar of this size, the next size should be used in the same manner. The cloudiness appearing in this jar, indicates the presence

of six parts in ten thousand. This is the largest proportion that can exist without actual danger to life. If no cloudiness appears without the employment of the largest jar, the proportion is only four parts of carbonic acid to ten thousand of pure air.

Sitting-rooms, study-rooms, offices, and sleeping-rooms require special care respecting ventilation, as many hours are often spent consecutively in such rooms, either in sleeping or in close application, which requires the highest degree of purity of air obtainable. An impure atmosphere renders the brain sluggish and the mind obtuse. Drowsiness is often encouraged by an impure atmosphere; but healthful sleep cannot be obtained in an atmosphere charged with impurities.

The Rum Family.

NO greater calamity can befall a quiet, peaceful community than to have a bad family move into it. But no neighborhood ever suffered more from the bad influence of a family of wicked persons than from the effects invariably produced in any city or village by the advent of the rum family, with its numerous progeny of vices, irregularities, and crimes. We propose to devote this chapter to a consideration of the leading traits and characteristics of the rum family, and to make our readers sufficiently well acquainted with the various members of the family to convince them that they are all unsafe associates for young men, or indeed for any one who wishes to maintain his self-respect, and his standing as a useful member of society.

The original alcohol family contains half a dozen or more members, some of whom, although naturally inclined to evil, have become useful members of society; while others have been the means of a vast deal of harm. The four best known to the public have been supplied with names by the chemist, to distinguish them from each other, and are known as *methylic* alcohol, *ethylic* alcohol, *amylic* alcohol, and *butylic* alcohol.

The first of these, methylic alcohol, is commonly known as naphtha. Methylic alcohol, or wood naphtha, is derived from the distillation of wood. It produces intoxication very quickly when drunk; but its effects are very transient, owing to its great volatility. It is not often used as an intoxicant, but has been so employed by persons of peculiar taste, or confirmed inebriates who were prevented from obtaining their customary allowance of grog. The author once had a patient who on several occasions swallowed half a pint of naphtha, when brandy or whisky could not be obtained.

Ethylic alcohol, or wine spirit, is the intoxicating element of spirituous liquors, and is obtained by the distillation of fermented liquids. The most common form in which it is used as a beverage is in brandy, whisky, beer, wine, etc. It is seldom found pure in commerce, being usually mixed with water. This variety of alcohol is more intoxicating in its effects and more injurious to the vital tissues than the preceding.

Butylic alcohol is generally obtained by the fermentation of the beet root. It is also, perhaps, produced in the fermentation which occurs in butter and cheese when they become old and rancid, since these substances contain an acid known as butyric acid, which is derived from this kind of alcohol. It is this which gives to frowy or rancid butter and very old cheese their peculiar flavor. This member of the family is still more active in intoxicating properties than those already mentioned, producing an intoxication which is very slowly recovered from, and in which there is very low prostration, trembling of the muscles, and severe coldness.

Amylic alcohol, or fusel-oil, is produced by the fer-

mentation of potatoes, and also, to some extent, by the fermentation of grains and fruits. It has a burning taste and pungent odor, and is the characteristic constituent of bad whisky. A few drops of fusel-oil will produce as profound an intoxication as a considerable quantity of ordinary alcohol, which accounts for the infuriating and deadly effects of bad whisky, as well as its rapidly fatal effects, as often seen among miners, negroes, and Indians. The deadly effects of cheap rum from the West Indies have become so manifest in some of the South Sea Islands, controlled by the English government, that it has become necessary to prohibit its introduction.

There are several other alcohols closely allied to those mentioned, and with similar properties, besides numerous other compounds which are classed by chemists in the "alcohol series," among which are the well-known substances, carbolic acid and creosote, the caustic and poisonous properties of which are too well known to require other than mere mention. If not own brothers, these compounds are at least cousins of "the demon of the cup."

Intoxication.—Each member of the alcohol family is capable of producing poisonous or intoxicating effects. In fact, they are all poisons, the effects of which have been termed *intoxication*, although the word "intoxication," when strictly used, means simply poisoning, and is properly applied to the condition of the system when laboring under the influence of any poison whatever. This use of the word is not very common in our language, although in the German language it is frequently so employed.

The Properties of Alcohol.—Perhaps the reader will be interested in the following remarks made by the author in a lecture at a temperance convocation a few years ago :—

Here is a test for alcohol : If you drop a little of this fluid into any substance containing alcohol, there will appear a very marked greenish color. Here is a glass vessel containing alcohol. I put a little of the test into it, and there is at once a perceptible change of color. Here is a vessel containing brandy. I need not tell you that it contains alcohol, for you see that the application of the test shows it at once. In the same way I will test the liquid contained in these other vessels, which are whisky, ale, gin, and hard cider. You see that the green color is very deep in each one. Here is some beer. I drop in a little of the test, and you see at once a green tinge spreading through the foam that rises up in the tube, and also gathering at the bottom. This is presumptive proof that there is alcohol in beer.

Poison in Bitters.—I have some other things here that I propose to test. There are a number of good people in the world who would not think of touching a drop of gin or whisky, but do not have the slightest objection to taking a glass of bitters every morning. They will recommend you to take a little bitters for your stomach's sake. Here is a bottle of Hostetter's Stomach Bitters. I pour a little of it into this tube, and apply the test. You see how green it turns. It has almost as much alcohol in it as Scotch Whisky. Look at this sample of Jamaica Ginger. I put in only a few drops of the test, and it turns as green as the gin. It has just enough ginger in it to flavor the alcohol.

Here we have a bottle of "Temperance Bitters," or at least what is advertised as such. This is Dr. Walker's California Vinegar Bitters. The proprietor is taking an active part in the temperance work on the Pacific Coast. He is one of the most zealous advocates of temperance in the State, and publishes a temperance almanac to advertise his "bitters," which he declares contain no alcohol. Let me read you what is printed on the paper that goes around the bottle: "Dr. J. Walker's California Vegetable Vinegar Bitters, the Great Blood Purifier and Life-giving Principle. A remedy for dyspepsia, indigestion, consumption, sore eyes, stomach-ache, fits, palpitation of the heart, biliousness, etc., etc., tape, pin and other worms. No alcohol enters into the composition of the bitters. That curse is not offered for medicine. Nothing but invigorating and purifying herbs give them their wonderful powers to cure." In order to determine the amount of alcohol contained in a bottle of the bitters, I had half a bottle distilled by the chemist, and in this flask you see the product of the distillation. By means of the alcoholometer, it has been found to contain twenty per cent of alcohol. Now we apply the test. There is as beautiful a green as you could desire to see. I will guarantee this bottle of bitters to contain five per cent of alcohol.

Fire-Water.—Now let me call your attention to some of the physical properties of alcohol. It is combustible, as you all know. I will touch a match to some of this Jamaica Ginger. See how it flames up. It continues to burn as I pour it from one vessel to another. How evidently appropriate is the Indian's name for alcohol, "fire-water"!

In addition to this, alcohol is a *desiccant*, that is, it is drying in its character. I have been using some of it as a drier. I put this piece of steak into alcohol a few days ago, and I think it would now answer very well as a tap for a boot. After a few weeks, it will become so dry that I could rub it in pieces with my fingers.

An Alcohol Omelette.—This egg which I hold in my hand is the representative of an animal. The complete fowl is not here. If you place it under the proper conditions, that is, if you simply keep it warm,—you know we have artificial "mothers" nowadays,—it will develop into a full-fledged chicken. We can take the effect of alcohol upon this egg as a sample of what it will do to the human body. As I break the egg into a vessel containing whisky, you see that it turns white, and it will soon become as hard as though it were dropped into boiling water. If the vessel had contained pure alcohol, it would become so hard in a short time that I could turn the vessel up-side down without spilling out the egg. Alcohol has the same drying and hardening effect upon the human body. The liver, the heart, and in fact the whole body, is made up principally of albumen and fibrine, the substances which compose the egg.

A Human Pickle.—Besides its drying properties, alcohol is also an antiseptic; that is, it possesses the property of preventing decay in perishable substances. Some one may say that if alcohol prevents decay, it ought to be valuable in preventing the decay and death of the human body. In fact, a young man once told me that his grandfather had taken, during his life, a hogshead of Jamaica rum, and he was sure that it had been the means of preserving him to a good old age.

During the Centennial year, while I was in Wilmington, Delaware, I heard of a man who was one hundred and seventeen years old on the fourth of July. I was paying a good deal of attention to the subject of hygiene just at that time, and I thought perhaps he had lived so long because he was temperate in his habits. Upon inquiry, however, I found that he was an inveterate smoker, and that for a hundred years he had taken his toddy regularly. This was quite a disappointment, but I resolved to see him, nevertheless. When I found him, I thought that whisky had not done so much for him after all. He hardly looked like a human being, he was so dried and shriveled up. He looked like some of those strange creatures that Stanley saw in Africa. After seeing him, I came to the conclusion that he was a human pickle. He had been pickled by the use of alcohol, and had in reality been dead for the last thirty or forty years, though his friends had neglected to bury him.

It is through its antiseptic properties that alcohol interferes with the process of digestion. The process of digestion is in some respects similar to that of fermentation. If you keep meat in alcohol, it will never decay. If, therefore, you take alcohol into the stomach after each meal, you will interfere with the process of digestion which is going on there, and will in time seriously impair the digestive functions of the stomach. Alcohol also destroys the pepsin of the gastric juice.

The Whisky Breath.—In the next place, alcohol is volatile. Many who use whisky wish it was not; for it is this property which enables any one to detect a man who has been drinking, by the odor of his breath. This

is the reason why some people carry cloves and things of that sort in their pockets to chew on frequent occasions.

Alcohol an Irritant.—That alcohol is an irritant, may be readily shown by placing a drop of it in the eye. I recently had a patient who was suffering with a disease of the eye, for which I prescribed a solution of atropia to be placed in the eye. The druggist used a solution of atropia in alcohol for making the lotion, and the effect on the eye of the patient was so irritating that she came very near losing it, although the solution contained not more than ten drops of alcohol to the ounce. If, then, it is irritating on the outside, how much more dangerous must be its effect on the inside, when it comes in contact with those delicate little cells which do our thinking and feeling for us, and perform all the work of the body.

How Alcohol Stimulates.—Alcohol is often called a stimulant, and so it is, if we use the word in its proper sense. A stimulant is well defined by an English physician as "something that gets strength out of a man instead of putting it into him." There is a general idea that drinking whisky makes a man stronger; but this is a mistake. A whip is a stimulant to a tired horse; it makes him go faster, but it does not make him any stronger. This is precisely the effect that alcohol has upon the human body. Experiments show that a man is actually weaker, that he cannot lift so much after he has taken a drink of liquor as he could before. A man who has just had a glass of whisky, feels as though he could run faster, lift more, or make a better speech, than he ever did before in his life; but the fact is that both his muscular and mental powers have been impaired. The feeling of strength is apparent, not real.

Let us now notice a few of the arguments against the use of alcohol, which scientific research has developed.

1. Alcohol a Poison to Plants.—Vital properties are pretty much the same in a general way, whether manifested by a mushroom or a man; and any substance which will destroy the life of a plant is not likely to be wholesome to human beings. If a plant be watered with a solution of alcohol, its leaves soon wither, turn yellow, and the plant dies, even when the proportion of alcohol is so small as one part in one thousand parts of water.

2. Alcohol a Poison to Animals.—A tadpole, when dropped into a vessel containing alcohol, dies in a minute. Leeches and other small animals succumb in like manner.

A New York journal recently reported a series of experiments by a French physician on the influence of alcoholic liquors on fowls, as follows:—

"He administered to them brandy and absinthe, and found one and all to take so kindly to their unwonted stimulants that he was forced to limit each bird to a daily allowance of six cubic centimeters of spirits, or twelve of wine. There was an extraordinary development of cocks' crests, and a rapid and general loss of flesh. The experiments were continued until it appeared that two months' absinthe-drinking sufficed to kill the strongest cock or hen; while the brandy-drinkers lived four months and a half, and the wine-bibbers held on for ten months before they died the drunkard's death."

Drunken Goats.—Some Pennsylvania beer-sellers tried the effects of beer upon a goat. Whether the experiment was for the purpose of determining the quality of the beer, or the constitutional toughness of the goat, is not recorded; but the result was fatal to the goat,

notwithstanding the hardihood for which he is proverbial. Just how many glasses were required to extinguish him, is not mentioned; but he died, and the high quality of the beer was established beyond the possibility of cavil.

But this is not the end of the story. The Humane Society heard of the proceeding, and immediately began an action against the beer-venders for cruelty to animals. The action was undoubtedly justifiable; but it is a matter of wonderment that the same law-makers who have made it an offense to kill goats with beer, have never once thought of its being a crime to kill human beings by the same means, although there are millions of human beings sacrificed in this way, to one goat. It is to be hoped that the question of prohibition will be agitated until human beings are at least as well protected as goats.

Swine Topers.—The eminent Dr. Dujardin Beaumetz, of Paris, has been engaged for some years in conducting experiments to ascertain the effects of alcohol upon various animals, chiefly pigs, and finds it to be uniformly that of a poison. A brilliant writer wittily says, "If lower animals were addicted to the drug to one-tenth the degree man is, in a short time there would not remain upon the face of the earth an animal which would be tamable, workable, or eatable."

3. Alcohol a Poison to Human Beings.—Notwithstanding the apparent impunity with which diluted alcohol in the form of various liquors may be taken, pure alcohol is rapidly and certainly fatal when taken into the stomach without dilution. Cases of instant death from drinking a considerable quantity of strong liquor have often been recorded; and numerous instances of death from this cause are constantly occurring in every large

city. As we shall show hereafter, alcohol in every form is still a poison, the rapidity of its effects being largely determined by the degree of dilution in which it is introduced into the system.

4. Alcohol an Irritant.—The irritating effects of alcohol are readily observed by placing a drop upon a raw surface. Even a very dilute solution will produce intense suffering. Still more profound, though for a time less irritating, effects are produced when the alcohol is absorbed into the system, and comes in immediate contact with the delicate internal structures of the body.

5. Alcohol a Narcotic.—Its first effects are exciting; but like most substances of similar nature, its secondary and more prominent effect is that of a narcotic. It benumbs the sensibilities. If a man is exhausted, it relieves the sense of fatigue by obtunding his senses, not by replenishing his wasted energy. Persons who have died from an overdose of alcohol, present all the indications of narcotic poisoning.

6. Alcohol an Anæsthetic.—A tablespoonful of strong alcohol, held in the mouth for two or three minutes, will obtund the sense of taste so as to render a person unable to distinguish sweet from sour, saline from bitter. If taken in a sufficient quantity, it will relieve the sense of pain sufficiently to enable a surgeon to perform an operation with little or no suffering on the part of the patient. A few years ago we employed it successfully as an anæsthetic to enable us to perform an operation upon the eyes. The patient, a lady, asserted that she felt scarcely any pain, although the operation involved the most sensitive portions of the eye, and required fully half an hour for its performance, as both eyes were operated upon.

7. Alcohol Not a Food.—The aristocratic toper, who wishes to give an air of respectability to his vice, will claim that alcohol is a food. He will cite, in proof, instances in which persons have lived for weeks by the aid of no other nutriment, taking nothing but alcohol and water. This semblance of argument scarcely needs exposure; for the most it can be claimed to prove is the fact that persons have lived several weeks while taking only alcohol and water. The fact that individuals have in several instances been known to live from thirty to sixty days while taking only water, shows conclusively that those who survived a shorter time on brandy and water, lived in spite of the alcohol instead of by its aid.

8. Alcohol Makes Bad Blood.—Those who have maintained that alcohol is a food, have made many experiments for the purpose of establishing their theory upon scientific grounds. By these experiments, it has been found that the urine and other excretions contain less of the worn-out material of the tissues when a person is using alcohol than when he is abstaining. From this alone it is concluded that alcohol prevents the wearing out, or disintegration, of tissue,—a most astonishing conclusion. No one but a man stoutly prejudiced in favor of alcohol would think of forming such a conclusion. A far more rational deduction from the premises would be that the presence of alcohol in the system prevents the excretory organs from eliminating from the body the dead and poisonous products which result from the wearing out of the tissues.

It is on account of this impure state of the system that the flesh of spirit drinkers is notoriously so difficult to heal in cases of wounds or surgical operations.

9. Alcohol Destroys the Blood.—When this fiery drug is taken into the stomach, it is soon absorbed into the circulation, where it comes in contact with the corpuscles of the blood. The effect upon these delicate and important structures we can study by applying alcohol to the blood outside of the body; for the corpuscles will retain their life and activity for a time after being removed from the body, if placed under proper conditions. To make sure of no mistake about this matter, we will perform the experiment while we write. Our microscope, which will magnify one million times, being in readiness, we thrust a needle into the finger, and thus obtain a tiny drop of blood. Placing it upon a glass slide, we adjust it upon the instrument, and look at it. Although the film of blood in view is so thin as to be transparent, it is crowded with beautiful bi-concave disks, the red blood corpuscles, each of which is perfectly formed, though only one thirty-five hundredth of an inch in diameter. Now we apply a drop of alcohol, a very tiny drop. Mark the effect. No sooner does it touch these little bodies, than they begin to shrink, and soon lose all resemblance to their natural appearance. In a short time they can be seen breaking up into fragments; and in five minutes from the commencement of the experiment, the once beautiful and symmetrical bodies which compose one-half of the blood, are reduced to broken fragments and shapeless masses. They have been fairly cut in pieces and eaten up by the alcohol.

Rum Choking.—"But what harm does this do?" says the toper or the moderate drinker; "the loss of a few blood corpuscles cannot be of any great consequence." The ultimate effects are the same as though the supply

of air was cut off from the lungs by a cord tightly drawn around the neck. The business of the red corpuscles is to carry oxygen from the lungs to the tissues. If they are destroyed, oxygen cannot be carried in sufficient amount, and the blood becomes foul, being charged with large quantities of carbonic acid, a poisonous substance which ought to be replaced by oxygen. One of the quickest ways of destroying life now known, is to cause an animal to inhale a poisonous gas known as carbonous oxide, which has the effect to paralyze all the blood corpuscles. Alcohol does the same thing just in proportion to the quantity taken.

10. Alcoholic Degeneration.—In addition to its effects upon the corpuscles, alcohol produces other serious changes. One of the most important of these is coagulation, or thickening of the fibrine of the blood, occasioning the formation of little clots, which are swept along in the blood current until they reach the finest capillaries, where they are lodged, thus obstructing the circulation, and, according to the eminent Prof. Carpenter, of England, constituting the first beginning of organic disease of the nerve centers and other important organs. These minute clots are often the cause of boils and other troublesome abscesses; and when they become enlarged, as they sometimes do, they may produce instant death by the plugging up of a large artery in the brain,—an accident which there is every reason to believe is not uncommon in cases in which large quantities of alcoholic spirits are taken.

Alcohol also greatly increases the amount of fat in the blood, probably by preventing the changes necessary to complete digestion or assimilation of the fat. In

consequence of this surplus of free fat in the blood, fatty degeneration of the heart, blood-vessels, liver, kidneys, and in fact of every part of the body, is induced, the fat particles being deposited in these various organs in place of their proper tissue.

It may further be objected that these changes do not occur unless very large quantities of alcohol are used. This, again, is an error. Dr. Carpenter is authority for the assertion that the changes in the corpuscles and the fibrine of the blood take place when not more than one part of alcohol to five hundred of blood is employed. Thus it will be seen that the very weakest wines are unsafe, since none of them contain less than three to five per cent. Even small beer would be capable of doing mischief in this way.

11. A Drunkard's Heart.—When alcohol is taken into the blood, it soon comes in contact with the nerve centers which govern the action of the heart. Its effects are the same as upon the other nerve centers. It paralyzes them, just as chloroform does the brain. Then the heart is like a steam-engine without a governor, or a clock from which the pendulum weight has been removed. It runs down with wonderful rapidity. This effect is largely due, also, to the influence of alcohol upon the small blood-vessels; the nerves which control them becoming paralyzed, they become dilated or relaxed, and so afford less resistance to the action of the heart, allowing it to beat too rapidly. This increased action is most unfortunately mistaken for increase in strength on the part of the organ, when it is mere increase of action —wasted force. The amount of extra work done by the heart under the influence of liquor may be readily

estimated. Dr. Parkes, by a series of careful experiments, found that the pulse of a man whose heart beat about seventy-four times a minute, or 106,560 times in twenty-four hours, when drinking only water, was, when under the influence of one ounce of alcohol per day, compelled to beat 430 times more in a day. Two ounces of alcohol per day caused an increase of 1,872 beats a day. Four ounces required 12,960 extra beats a day. Six ounces drove the pulse up to 18,432 extra beats; and eight ounces, to 25,488 unnecessary beats, or nearly one quarter more than when taking only water.

A Toper's Pulse.—The pulse of a toper is characteristic. It is weak, frequent, easily quickened, even by very slight exercise, and very irregular. Alcohol has a directly depressing influence upon the heart, diminishing its power for work, and rendering it subject to both functional and organic disease.

12. The Whisky Flush.—The local blood supply of the body is regulated by means of special nerves, which follow the blood-vessels from the heart to their minutest distribution. One of the effects of alcohol is to paralyze the centers in which these nerves originate, which renders the vessels unnaturally dilated, allowing too much blood to enter various parts, thus occasioning congestion and even inflammation. In this way the lungs, liver, heart, or any other portion of the body, may become diseased. It is this which causes the drunkard's face to flush; and not only the face, but the whole body—the brain, the liver, every vital organ—is in the same state of congestion. Is it any wonder that the toper feels depressed and enervated, and in need of a "pick me up" the next morning after a debauch? or that he falls so

easy a victim to causes of disease which others escape? It was long ago observed that drunkards were the favorite victims of cholera, the plague, sun-stroke, and other causes of speedy death. The system is prepared, by the paralyzing influence of the drug, for almost any form of disease to which human flesh is heir.

13. A Toddy Blossom.—One of the signs of intemperance, which its victims put forth the most strenuous efforts to suppress, is that peculiar enlargement of the nose, with intense redness, so appropriately termed the "rum blossom." The effect of alcohol is to paralyze the nerves of the blood-vessels; and when its frequent use occasions the almost constant paralysis and engorgement of the blood-vessels of the face and nose, more particularly the latter, it grows too fast, and by this means may acquire enormous size.

14. The Drunkard's Brain.—The brain, when it is healthy, is so soft that it would scarcely retain its shape if it were not for the skull. The sharpest knife is required to cut it without mangling its structure. It is necessary to immerse the organ in alcohol for weeks, or even months, in order to harden it, when a careful examination is necessary. But a drunkard's brain presents a marked contrast. It is already hardened—pickled almost. In the dissecting room, it affords rare pleasure for a medical student to secure the desiccated brain of an old toper. A celebrated anatomist declared that he could tell a drunkard's brain in the dark, by the sense of touch alone. A London physician reported a case in which he found, upon making a *post-mortem* examination, so strong an odor of alcohol emanating from the brain that when he applied a match to it, it burst into flame.

The quantity of alcohol in the brain is sometimes so great that it can be collected by distillation after death.

It must not be supposed that every drunkard's brain is as hard as a pickled one; but it may be fairly supposed that the hardening effect of alcohol has no little influence in the production of degenerations of the brain, such as result in various forms of progressive paralysis. Numerous functional disorders of this organ are also traceable directly to the habitual use of alcoholic liquors. Locomotor ataxia, an almost hopeless malady, involving the brain and spinal cord, is very often the result of intemperance.

15. Alcoholic Apoplexy.—The intense congestion of the brain induced by alcohol is the very condition in which apoplexy, or rupture of a blood-vessel, is most likely to occur. When the walls of the arteries have been weakened by fatty degeneration, the danger is increased many fold.

It has been claimed that old persons require alcohol on account of the diminished activity of their vital functions. The fact above stated shows clearly that in old age the danger from the use of alcoholic liquors is greatly increased.

16. Alcoholized Nerves.—Who has not observed the trembling, unsteady hand of the man who has long been accustomed to the use of alcoholic liquors? Often his shaking hand deposits a share of the poisonous dram upon the ground. If he is a mechanic, he cannot resume his work without a strong toddy "to steady his hand;" if an accountant, he must have a glass to "clear his head." This condition, at first temporary, finally becomes permanent, and thus hopeless disease may originate.

17. The Drunkard's Stomach.—We have endeavored to illustrate by colored plates the contrast between a healthy stomach and a stomach affected by alcoholic disease.

Figure 1, PLATE XXIV., represents a healthy stomach. By the removal of the anterior wall of the stomach, the mucous membrane lining the interior is also shown. We would direct special attention to the uniform rosy tint characteristic of the healthy state of this organ, in which digestion, one of the most important of the vital processes, is performed. The stomach is a hollow organ, and physiologists have succeeded in making a permanent opening into its interior in some of the lower animals, through which they could watch the organ at work, and study the effects of the various substances which were introduced through the mouth, or through the artificial opening. Accident has, in several cases made the same observation possible in human beings. One of the most notable cases was that of Alexis St. Martin, an employee of the Hudson Bay Fur Company, who, in the early part of this century, received a gun-shot wound, which carried away a considerable portion of the abdominal wall, and perforated the stomach. The wound healed in such a way as to leave a permanent opening into the stomach, through which the process of digestion, and the effects of various substances upon the stomach and digestion, could be accurately observed for many years. Dr. Beaumont made a careful study of the effects of alcohol upon the stomach of this man.

18. The Stomach of a Moderate Drinker.—Figure 2, PLATE XXIV., represents the condition of the stomach of a person accustomed to use alcoholic drinks in what

is known as "moderation;" as, for example, a man who takes his glass of grog before breakfast or at dinner, or a bowl of sling as a "night-cap." The mucous membrane of the stomach is in a state of congestion. This congested condition was observed by Dr. Beaumont in the stomach of Alexis St. Martin whenever he was allowed to take alcoholic drinks, of which he was very fond, even in moderate quantity. The effect of alcohol, as well as that of mustard, pepper, pepper-sauce, spices, and condiments, is to produce a state of excitement and irritation in the stomach, the result of which, when frequently repeated, is permanent congestion, and is the cause of numerous forms of dyspepsia. But alcohol does more than simply irritate the stomach. By its antiseptic influence, it prevents the digestion of the food; and by its chemical properties, it destroys the action of the gastric juice, and so does triple mischief.

19. The Stomach of a Hard Drinker.—Figure 3, PLATE XXIV., represents the actual state of things which has been found existing in the stomachs of persons accustomed to use alcoholic liquors daily in large quantities. The blood-vessels are dilated, as in the case of the moderate drinker; and in addition, small ulcers are scattered over the diseased surface. The stomach of an old toper might be in the condition shown in this plate without his being conscious of the fact, as the nerves of the stomach are so paralyzed by alcohol that their normal sensibility is quite lost.

20. The Stomach in Delirium Tremens.—Figure 4, PLATE XXIV., represents in a very faint degree the terrible condition present in the stomach of a victim of alcoholic poisoning, suffering with what is generally

PLATE XXIV.—EFFECTS OF ALCOHOL.

Fig. 1. Healthy Stomach.

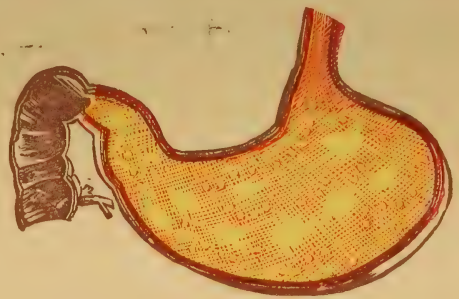


Fig. 3. Stomach of Hard Drinker.

Fig. 2. Stomach of Moderate Drinker.

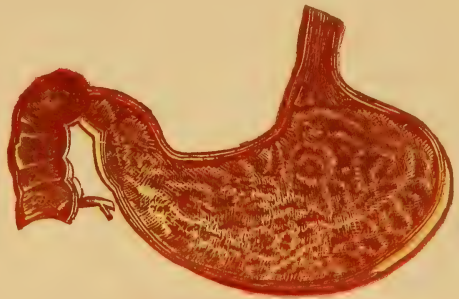


Fig. 4. Stomach in Delirium Tremens.

known as "delirium tremens," or acute alcoholism. The mucous lining of the stomach is in a state of intense inflammation, so that its functions are wholly suspended. In a case which we had under treatment a few years ago, we found the patient at our first visit suffering most intense nausea. He had been vomiting incessantly for two or three days. The smallest sip of water could not be retained upon the stomach. Great quantities of mucus were vomited, together with blood. During such an attack, the patient generally feels little pain, and often refers his symptoms to his stomach, since his sensibilities are so benumbed that he is unconscious of his real condition. Dr. Beaumont observed, on one occasion when Alexis St. Martin had been drinking heavily for a few days, that although his stomach was in a state of inflammation and ulceration, he was insensible of pain, and felt no inconvenience, only suffering from a severe headache. *Post-mortem* examination of persons who have died of delirium tremens usually discloses the stomach black with mortification.

21. Alcoholic Insanity.—The condition of a man under the influence of liquor is precisely the same as that of an insane man as regards his mind. When the act of getting drunk is frequently repeated, the condition of the mind induced by drink may become permanent, when the individual is a fit subject for an insane asylum.

22. A Drunkard's Liver.—The appearance of a drunkard's liver is characteristic. "Hob-nailed liver" is another name for the diseased organ as found in spirit drinkers. It is shrunken, hard, and almost totally useless, insensible alike to pain and proper sensibility. Externally, it looks like the hob-nailed sole of an English

cartman's shoe, from which resemblance it received its name.

23. Beer and Bright's Disease.—The idea that beer is harmless because it contains but a small proportion of alcohol, has been wholly refuted by the observation that Bright's disease and other maladies of the kidneys are far more frequent among beer-drinkers than among any other class of men.

24. Drunkard's Dropsy.—The bloated features of the sot indicate too plainly for mistake the dropsical tendency of the alcohol habit; and the ultimate effects of the poison upon the liver and kidneys, as already described, lay the foundation for one of the most incurable of all the forms of dropsy. We have seen many cases of dropsy induced in this way, and recovery, even under the most favorable circumstances, has been very rare indeed.

25. Alcoholic Consumption.—Dr. Richardson points out the fact that alcohol, instead of preventing, actually produces consumption, and that of the most fatal type. He states that a person suffering from alcoholic phthisis shows no improvement under treatment. The disease steadily, surely, and usually quite rapidly, progresses to a fatal termination.

26. Alcohol vs. Strength.—The laborer, the traveler, and the soldier use alcohol under the delusion that it strengthens. When fatigued, the laborer takes a glass of grog, and feels better, or thinks he does. He imagines himself stronger. His increased strength, however, is wholly a matter of imagination. Experiments show that a man can lift less when under the influence of alcohol than without it.

27. Alcoholized Muscles.—Among the other degenerations produced by alcohol, fatty degeneration of the muscles should be mentioned. This degeneration consists in a change of the proper muscular tissue to fat. The process may involve all the muscles of the body, or simply a few, as those of the heart and blood-vessels. It is an injury which can in no way be repaired, and must inevitably end in death, sooner or later.

28. Alcohol vs. Animal Heat.—The sensation of warmth produced by taking a glass of wine or brandy is delusive. The circulation is unbalanced, and for a few moments there is a seeming increase of heat; but the thermometer shows that there is a decrease in the temperature. Says Dr. Parkes, the eminent English sanitarian, "All observers condemn the use of spirits, even of wine or beer, as a preventive against cold." The names of Dr. King, Dr. Kane, Capt. Kennedy, and Dr. Hayes may be cited as holding this opinion. In the last expedition in search of Sir John Franklin, the whole crew were teetotalers.

29. Alcohol a General Disturber in the Vital Economy.—Close upon the derangement of the stomach, which is certain to come sooner or later with all drinkers, follows nearly every other functional disease possible to the human system. Every organ is disturbed. The whole vital machinery is deranged. Strange noises are heard in the head, occasioned by the rushing of hot torrents of poisoned blood through the distended blood-vessels of the head, which pass near the ear. Black spots and cobweb appearances annoy the sight. Alcoholic amaurosis, or amblyopia, comes on, and the sight becomes impaired; sometimes blindness follows. The dilated blood-vessels

of the skin become permanently enlarged, especially in the face and nose, and the drinker has a rum-blossom. Skin diseases of various sorts are likely to appear, particularly eczema of the fingers or toes, or on the shins. An unquenchable thirst seems to be ever consuming the blood, and nothing but alcohol will even temporarily assuage the desire for drink. Notwithstanding, large quantities of fluids will be taken, often amounting to several quarts a day, which overwork the excretory organs.

The liver and kidneys are disturbed in their functions, one day being almost totally inactive on account of the congestion, and the next rallying to their work, and doing double duty.

Every organ feels the effect of abuse through indulgence in alcohol, and no function is left undisturbed. By degrees, disordered function, through long continued disturbance, induces tissue change. The imperfectly repaired organs suffer more and more in structure, until the most extensive and disastrous changes have taken place.

30. Alcohol vs. Longevity.—It is not very easy to prove that the influence of alcohol, as of every other poison, is to shorten life. Dr. Willard Parker, of New York, shows from statistics that for every ten temperate persons who die between the ages of twenty-one and thirty, fifty-one intemperate persons die. Thus it appears that the mortality of liquor-users is *five hundred per cent* greater than that of temperate persons. These statements are based on tables used by life insurance companies.

31. The Entailments of Alcohol.—The drinker himself is not the only sufferer from his vice. Indeed, it seems in many cases that he is not the greatest sufferer.

He may even live out his threescore years and ten, in apparent defiance of the laws of nature and the warnings of friends; but look at his children. Are they as strong and robust as he?—Oh, no; instead, we often see them frail, nervous, imbecile, idiotic,—poor specimens of the race. "The iniquities of the father are visited upon the children."

Dr. S. G. Howe attributed one-half the cases of idiocy in the State of Massachusetts to intemperance, and he is sustained in his opinion by the most reliable authorities. Dr. Howe states that there were seven idiots in one family where both parents were drunkards. One-half of the idiots in England are of drunken parentage, and the same is true of Sweden, and probably of most European countries. It is said that in St. Petersburg, most of the idiots come from drunken parents.

A Relic of Barbarism.

THE origin of a custom which has enslaved many millions of human beings in its toils, which has within a few centuries fixed itself so firmly upon the race, and become so widespread as to be practically universal among mankind, whether civilized or savage, cannot be without interest to those who are users of the weed, as well as to those who wage war against this evil practice. The latter, especially, will find in the ignoble origin of tobacco-using an argument of no little force against this vile habit; and it is for this purpose particularly that we write.

Tobacco-Using Discovered.—In the month of November, 1492, when Columbus discovered the island of Cuba, he sent two sailors to explore it, who reported, when they returned, among many other strange and curious discoveries, that the natives carried with them lighted fire-brands, and puffed smoke from their mouths and noses, which they supposed to be the way the savages had of perfuming themselves. They afterward declared that they "saw the naked savages twist large leaves together, and smoke like devils."

To civilized human beings, this was the first sight of

the vile habit which has become so common that every city, town, and village is actually perfumed, or more properly fouled, with the vile stench of the poisonous weed. The impression made upon the unsophisticated Europeans was evidently not greatly in favor of the custom, since they compared the smoking Indians to devils.

Originating with the wild barbarians of America, the smoking habit was, after some years, introduced into Europe; and receiving the sanction of the physicians who, just at that time, chiefly occupied themselves in searching for some new nauseous compound with which to experiment upon the lives of their patients, it was rapidly adopted, not only by the lower classes, but by those in high authority, even princes and nobles participating in the new intoxication.

Origin of Snuff-Taking.—It appears that the taking of tobacco in the form of snuff was also discovered among the savage natives of this continent upon the second visit of Columbus to America in 1494. A Roman friar, named Pane, who accompanied the expedition, thus describes the custom as it then existed among the Indians: "After reducing the leaves to a fine powder, they take it through a cane half a cubit long; one end of this they place in the nose, and the other upon the powder, and so draw it up, which purges them much."

The purging referred to evidently describes the violent sneezing which resulted from the inhalation of the powdered poison. If the sailors thought that the smoking savages appeared "like devils," they certainly must have been ready to compare a party of sneezing Indians to a group of lunatics. However, it must be

confessed that the charge of lunacy could not be applied to the ignorant, barbarian snuff-takers with one-half so much propriety as to their civilized and enlightened, but certainly not wise, imitators. How so filthy, unnatural, and eminently disgusting a habit could ever have been cultivated by rational beings, is a most profound mystery.

Origin of Tobacco-Chewing.—In 1503, when the Spaniards landed in Paraguay, the natives attempted to repulse them, and came out against them in large numbers, beating drums, throwing water, and "chewing herbs and spurting the juice toward them." The herb employed was tobacco, and the object of its use in the peculiar manner indicated was to get the poisonous juice into the eyes of the intruders, and thus disable them by depriving them of sight. From this it would seem that tobacco-chewing was first practiced as a means of defense, for which purpose the expectorated juice was undoubtedly quite effective. We have seen modern tobacco-chewers whose copious expectoration made it next to impossible for any one to approach within several feet without being soiled with the vile juice. In the days when war was carried on by hand-to-hand combat, we can very readily understand that a wild Indian filling the air all about him with poisonous, irritating, filthy tobacco juice, would be a very formidable object.

The Inventors of Pipes and Cigars.—The first smokers employed what was practically identical with the modern cigar. Dry tobacco leaves were made into rolls, and wrapped with the leaves of Indian corn, one end being lighted, and the other placed in the mouth. Pipes were also employed, those used in North America being shaped almost exactly like the letter Y, except

that the stem was longer and the forked end was symmetrical. In use, the forked end was placed in the nostrils, and the other end in the dense smoke arising from tobacco leaves placed on glowing coals. In Mexico and South America, pipes almost exactly like those now in use, with numerous other forms, were employed in the same way in which pipes are now used.

Thus it appears that tobacco-using, together with the implements of its use and all the different modes of taking it, originated wholly with the heathen barbarians who roamed like wild beasts over the plains and through the dense forests of this continent four centuries ago. Civilized men have made no improvements or discoveries of any account in connection with its use; they have simply followed the example of those naked savages whom the discoverers of America saw chewing, snuffing, and smoking "like devils" almost four hundred years ago. It is evident, then, that tobacco-using is a barbarous custom in the fullest sense. As to how savages learned the use of the weed, history does not give us any hint; but the fact that pipes and snuff-taking tubes are found in their most ancient burial mounds, which are often surmounted by huge trees that must have required many centuries for their growth, is evidence of its great antiquity; and in this habit we may unquestionably find one of the causes which have reduced the American savage to his present degraded and deteriorated condition.

Reader, if you smoke, chew, or snuff the filthy weed, we would ask you to pause a moment between your whiffs, or before you renew your quid, or take a new pinch of the delectable poison, and consider whether it

is worthy of the dignity of an intelligent, enlightened, cultivated human being to spend his money, waste his time, and squander his health in imitating a vice which originated with ignorant, degraded savages, and remains a relic of barbarism which has been grafted upon civilization.

Chemists, botanists, and physicians unite in pronouncing tobacco one of the most deadly poisons known. No other poison, with the exception of prussic acid, will cause death so quickly, only three or four minutes being required for a fatal dose to produce its full effect. It is botanically known as *nicotiana tabacum*, and belongs to a class of plants known as the *volanaceæ*, which includes the most poisonous of all species of plants, among which are *henbane* and *belladonna*. There are more than forty different varieties of the plant, all of which possess the same general properties, though varying in the degree of poisonous character.

Nicotine.—The active principle of tobacco, that is, that to which its narcotic and poisonous properties are due, is nicotine, a heavy, oily substance, which may be separated from the dried leaf of the plant by distillation or infusion. The proportion of nicotine varies from two to eight per cent, Kentucky and Virginia tobacco usually containing six or seven per cent. A pound of tobacco contains, on an average, three hundred and eighty grains of this deadly poison, of which one-tenth of a grain will kill a dog in ten minutes. A case is on record in which a man was killed in thirty seconds by this poison.

A Pound of Tobacco Will Kill Three Hundred Men.—The poison contained in a single pound of tobacco is sufficient to kill three hundred men, if taken in

such a way as to secure its full effect. A single cigar contains poison enough to extinguish two human lives, if taken at once.

The essential oil has been used for homicidal purposes. Nearly thirty years ago, it was employed by the Count Bocarmé to murder his brother-in-law, for the purpose of securing his property.

The Hottentots use the oil of tobacco to kill snakes, a single minute drop causing death as quickly as a lightning stroke. It is much used by gardeners and keepers of greenhouses to destroy grubs and noxious insects.

A number of instances are recorded in which death has been produced by applying a little of the oil from the stem or bowl of an old pipe, to a sore upon the head or face of a small child.

Poisoning through the Skin.—The poison of tobacco is so potent and violent in its action that even the external application of the moist leaves to the skin is sufficient to produce most serious symptoms. If a cigar be unrolled, and the leaves composing it be applied over the stomach, great nausea will be produced in a very short time. This method has been used to induce vomiting. Cowardly soldiers have been known to place tobacco leaves under their arms just before going to battle, for the purpose of producing sickness.

Some years ago a man was detected in an attempt to smuggle a quantity of tobacco by placing the leaves next to his skin. The nearly fatal symptoms which followed, led to the discovery of the smuggler.

Deadly Vapor.—If tobacco is poisonous when applied to the skin, it is doubly so when inhaled. The smoke of tobacco contains, in addition to nicotine, sev-

eral other poisons, the chief of which are *pyridine*, *picoline*, *sulphuretted hydrogen*, *carbon di oxide*, *carbonous oxide*, and *prussic acid*, all of which are fatal poisons when received into the system in any other than the most minute quantities. Thus it is not to nicotine alone that the evil effects of smoking are due, but to all of these poisons combined.

Birds, frogs, and other small animals die when exposed to the fumes of tobacco in a confined space. Cheese-mites, bees, and other insects may be quickly killed by directing upon them a stream of tobacco smoke from an ordinary pipe.

Poisoning through the Lungs.—Inhalation is the most speedy way of getting any volatile poison into the system. The reason of this is obvious when the fact is made known that the lungs present a mucous surface fourteen hundred square feet in extent, every inch of which is in the highest degree capable of absorbing gaseous substances brought in contact with it. This membrane is of the most marvelously delicate character, being of such exceeding thinness that it forms scarcely any obstacle to the passage of gases which enter the lungs by respiration. Just underneath this delicate membrane passes all the blood in the body, or an amount equivalent to the whole quantity of the blood, once every three minutes. The vapory poison inhaled by the tobacco-smoker is not simply taken into the mouth and then expelled, but it penetrates to the remotest air-cells, and spreads itself out over the whole of the immense extent of membrane stated. Thus it is plain that the blood of the smoker is literally bathed in the narcotic fumes drawn from his pipe or cigar.

So readily does the system receive the poison of tobacco in this way, that it has repeatedly been observed as a fact that persons who are engaged in the manufacture of cigars often suffer much from the characteristic effects of nicotine poisoning.

When tobacco is applied to the mucous membrane, as in chewing and snuff-taking, its poisonous elements are absorbed in essentially the same manner as when it is applied to the skin, but much more rapidly. In chewing, considerable quantities are also absorbed through the stomach, being swallowed with the saliva.

Poisonous Effects of Tobacco-Using.—Very few users of the weed need to have a description of the effects of a moderate degree of poisoning from tobacco. The giddiness, nausea, and deathly sickness which follow the first attempt to use the drug, are indubitable evidence of the poisonous character of tobacco, which evidence is confirmed by the difficulty, in many cases very great, experienced in becoming addicted to its use. In severe cases of poisoning, violent vomiting and purging, vertigo, deathly pallor, dilatation of the pupil, a staggering gait, disturbed action of the heart, interference with respiration, and in extreme cases insensibility and syncope, are commonly observed. Only a very small quantity is necessary to produce these symptoms in a person not accustomed to its use; but in persons who have habituated their systems to the poison, a much larger quantity is required.

Persons not accustomed to the use of tobacco, often show symptoms of poisoning from taking a very small quantity of the drug, as by inhaling its fumes in a smoking-car or a bar-room. Infants are often sickened

by inhaling the air of a sitting-room which is poisoned by a smoking father. There is good reason for believing that not a few infants' deaths have occurred from this cause, as it is well known that young children are exceedingly susceptible to the influence of poisons of all kinds.

Condition of a Boy Learning to Smoke.—Of course no one has ever examined the internal organs of a boy while he was undergoing the terrible ordeal of "learning to smoke;" but lower animals have been examined while under its influence, and the conditions observed are thus described by an eminent scientist and physician:—

"From analogy derived from the inferior animals, which analogy must be very perfect, the conditions of the vital organs are as follows: The brain is pale and empty of blood; the stomach is reddened in round spots, so raised and pile-like that they resemble patches of dark Utrecht velvet; the blood is preternaturally fluid; the lungs are pale as the lungs of a calf, when we see them suspended in the shambles; while the heart, overburdened with blood, and having little power left for its forcing action, is scarcely contracting, but is feebly trembling, as if, like a conscious thing, it knew equally its own responsibility and its own weakness. It is not a beating, it is a fluttering heart; its mechanism is perfect, but each fibre of it, to its minutest part, is impregnated with a substance which holds it in bondage, and will not let it go."

Why All Smokers do Not Die of Tobacco-Poisoning.—It is often objected that while chemistry and scientific experiments seem to prove that tobacco is a powerful poison, the experience of thousands of persons

disproves the theory of its poisonous character, since if it were so intense a poison as described, cases of death from tobacco-poisoning would be much more frequent.

To this objection we answer, 1. One reason why so few persons are reputed to die of *nicotine*, or tobacco-poisoning, is the wonderful faculty the system possesses of accommodating itself to circumstances. Through this means the worst poisons may by degrees be tolerated, until enormous doses can be taken without immediately fatal effects. Corrosive sublimate, strychnia, belladonna, and many other poisons, may be thus tolerated.

2. In our opinion, the majority of tobacco-users do die of tobacco-poisoning. Death as surely results, ultimately, from chronic as from acute poisoning, though the full effects are delayed, it may be, for years. A man who dies five or ten years sooner than he should, in consequence of tobacco-using, is killed by the poison just as truly as though he died instantly from an overdose.

Chronic Tobacco-Poisoning.—The symptoms of chronic tobacco-poisoning cannot be better stated than in the following summary by Dr. B. W. Richardson, one of the highest medical and scientific authorities of England:—

"Smoking produces disturbances—

"*a.* In the blood, causing undue fluidity and change in the red blood corpuscles.

"*b.* In the stomach, giving rise to debility, nausea, and in extreme cases, sickness.

"*c.* In the heart, producing debility of that organ, and irregular action.

"*d.* In the organs of sense, causing in an extreme

degree, dilatation of the pupils of the eye, confusion of vision, bright lines, luminous or cobweb specks, and long retention of images on the retina, with other and analogous symptoms affecting the ear, viz., inability clearly to define sounds, and the annoyance of a sharp, ringing sound like a whistle or a bell.

"*e.* In the brain, suspending the waste of that organ, and oppressing it if it be duly nourished.

"*f.* In the nervous filaments and sympathetic or organic nerves, leading to deficient power in them, and to secretion in those surfaces—glands—over which the nerves exert a controlling force.

"*g.* In the mucous membrane of the mouth, causing enlargement and soreness of the tonsils,—smoker's sore throat,—redness, dryness, and occasional peeling off of the membrane, and either unnatural firmness and contraction, or sponginess of the gums.

"*h.* In the bronchial surface of the lungs, when that is already irritable, sustaining the irritation and increasing the cough."

The above quotation is of peculiar force, coming as it does from a man who is not only well qualified to speak on the subject from his high scientific attainments and large experience, but is peculiarly well fitted to speak authoritatively, and certainly without prejudice against tobacco, himself being, from force of long habit, a smoker.

Dr. Richardson has elsewhere asserted that the injury done to the blood-corpuscles by *nicotine* can be readily detected in the blood of an old smoker by examination with the microscope. He thus describes the changes which are found to take place in the blood of a smoker :—

Effects in the Blood.—"The blood is made thinner than is natural, and, in extreme cases, paler. In such instances the deficient color of the blood is distributed to the body altogether, rendering the external surface yellowish white, and puffy. . . . But the most important change is exerted on those little bodies which float in myriads in the blood, and are known as the red globules. These globules have, naturally, a double concave surface, and at their edges a perfectly smooth outline. . . . The absorption of the fumes of tobacco leads to rapid changes in them. Microscopically examined, they are found to have lost their round shape, to have become oval and irregular at their edges, and instead of having a mutual attraction for each other,—a good sign, within certain limits, of their physical health,—they lie loosely scattered. Indeed, they indicate to the learned observer, as clearly as though they spoke to him, that the man from whom they were taken was physically depressed, and deficient in both muscular and mental power."

The fact is established beyond the possibility of successful controversy, that tobacco is a poison, deadly in large doses, pernicious and harmful in all doses. It taints the breath, ruins the digestion, obliterates taste and smell, spoils the blood, oppresses the brain, depresses the heart, irritates the nerves, wastes the muscles, obstructs the liver, dims the vision, stains the skin, and deteriorates and contaminates every organ and tissue with which it comes in contact in the body. Its influence is to lessen vitality, to benumb the sensibilities, to shorten life, *to kill.*

Tobacco Predisposes to Disease.—By its deteriorating influence upon the system, tobacco lessens the

vital resistance of the body to other causes of disease, and so produces a prodisposition to nearly all classes of maladies. As bearing upon this point, we may quote the following from eminent authorities :—

"Look at the pale face, imperfect development, and deficient muscular power of the inhabitants of unhealthy, malarious districts. They live on, but with only half the proper attributes of life. So it is with the habitual smoker."—*Mr. Solly, F. R. S.*

"I do not hesitate to say that if a community of both sexes, whose progenitors were finely formed and powerful, were to be trained to the early practice of smoking, and if marriage were confined to the smokers, an apparently new and a physically inferior race of men and women would be bred up."—*Dr. B. W. Richardson.*

A British officer in India stated that of eleven officers sent out on an expedition, only two escaped in good health, and they were non-smokers.

In speaking against tobacco, Dr. Edward Smith, the eminent English authority and sanitarian, remarked, "The whole tendency of its action is toward disease, and it is impossible to say how much of good it has prevented,"

Smoker's Sore Throat.—The redness and dryness of the mucous lining of the mouth and throat so common with smokers, is the result of the direct irritation of the hot fumes of the poisonous weed which are drawn in through the pipe or cigar. This cause of this chronic disease of the throat is so very common that "smoker's sore throat" has come to be recognized as a distinct malady. Some smokers pretend to smoke

for the cure of throat difficulties; but the excuse is a mere pretense in most cases. Tobacco never cures sore throat. It may temporarily relieve local irritation, but can do no more, and always increases the disease.

Tobacco and Consumption.—The relation of impure air to disease of the lungs is everywhere recognized. It has been very clearly demonstrated that breathing impure air is the great cause of consumption, on account of the effect of poisonous elements upon the blood and the lungs. Even the impurities gathered from the blood itself exist in the air which has been once breathed, in such quantities as to render it unsafe to breathe again. This being the case, it will be readily seen that filling the lungs with the nicotinized smoke and hot fumes of tobacco from a pipe or cigar for several hours a day, cannot but be a most certain cause of lung disease. Moreover, experience shows this to be the case. Dr. C. R. Drysdale, the chief physician to the Metropolitan Free Hospital of London, declared in an article in *Public Health*, that "smoking in youth is no uncommon cause of pulmonary consumption."

Tobacco a Cause of Heart Disease.—The effect of tobacco upon the heart is indicated by the pulse, which is a most accurate index to the condition of the heart. The pulse of the tobacco-user says, in terms as plain as any words could, that his heart is partly paralyzed, that its force and vigor are diminished, that it is, in fact, poisoned. Old smokers, and not a few of those who have indulged but a few years, often suffer with palpitation of the heart, intermittent pulse, *angina pectoris*, and other symptoms of derangement of this most

important organ. There is, in fact, a diseased condition of the heart which is so characteristic of chronic tobacco-poisoning that it has been very appropriately termed "narcotism of the heart." Medical statistics show that about one in every four smokers has this condition. There is good reason for believing that not only functional but organic disease of the heart may be occasioned by the use of tobacco.

Tobacco and Dyspepsia.—Notwithstanding the fact that tobacco is very frequently recommended as a sovereign remedy for dyspepsia, we have become convinced by careful observation in hundreds of cases, that it is never a cure, and is in hundreds of instances a cause of dyspepsia. Tobacco is a narcotic. The effect of narcotics generally is to lessen the secretion of gastric juice, and to decrease the activity of the stomach. This tobacco does in a very marked degree. A man who is hungry may appease his desire for food by using tobacco if he is accustomed to it, or by the employment of some other narcotic. The desire is appeased, although the want still exists. It is through this same paralyzing influence that tobacco impairs digestion. Snuff-taking occasions dyspepsia by producing irritation of the nasal mucous membrane, which affects the stomach through sympathy.

Tobacco a Cause of Cancer.—There is no chance to doubt that tobacco-using is often a cause of this terrible disease. All eminent surgeons testify that they frequently meet cases of cancer of the lips and tongue which have been occasioned by smoking. A number of such cases have come under our own observation, and we do not doubt that a large share of cancers of the

lip and tongue originate in this way. This view is further strengthened by the fact that in the great cancer hospital of London, where more than ten thousand cases of this terrible disease have been treated, the number of men suffering from cancer upon the lip and tongue was three times as great as the number of women so affected, although the female cancer patients outnumber the men, five to one.

Tobacco Paralysis.—Within the last thirty years there has been a great increase in the frequency of the occurrence of a peculiar form of paralysis which seems to affect especially the nerves that supply the muscles, causing gradual wasting and loss of muscular power, which is fairly attributable to the increasing use of tobacco, as it most often occurs in tobacco-users.

A form of progressive paralysis of the optic nerve, causing "tobacco amaurosis," or blindness, is well recognized by oculists. These cases generally recover when the tobacco is discontinued, but will not get well so long as it is used.

Color Blindness, an affection which is increasing to an alarming extent, especially in Belgium and Germany, where smoking is more extensively practiced even than in this country, has been found largely attributable to the use of tobacco. This fact was first announced by an eminent Belgian physician, who made extensive investigations of the subject at the request of the Belgian government.

Nervousness from Tobacco.—Tobacco-users suffer much from nervousness, which is manifested in a great variety of ways. One person is easily startled; another is unnaturally irritable, is cross and irascible; another

cannot sleep at night; still another suffers from trembling of the hands, which greatly discommodes him in writing. In scores of cases, we have seen these symptoms disappear when the use of tobacco was discontinued. Temporarily, tobacco seems to give tone and strength and steadiness to the nerves; but the seeming strength is deceptive. It is purely artificial, and the ultimate effect is to increase the very difficulty which it seems to cure.

We have often known wives and young children to suffer severely from various nervous disorders which were wholly due to the effect upon their delicate organizations of the poisonous fumes of tobacco which they received through the poison-laden exhalations of their smoking husbands and fathers.

Hereditary Effects of Tobacco-Using.—There is no vice or habit to which men are addicted, whose results are more certainly transmitted to posterity than are those of tobacco-using. A vigorous man may use tobacco all his life, and be able to convince himself all the time that he is receiving no injury; but the children of that man, who ought to inherit from him a vigorous constitution and high health, are instead robbed of their rightful patrimony, and enter upon life with a weakly vital organism, with a system predisposed to disease and destined to premature decay. The sons of an inveterate tobacco-user are not as robust as their father; and the grandchildren, in case the children are tobacco-users, are certain to be nervous, weakly, sickly creatures. This fact we have verified in so large a number of cases that we make the statement fully prepared to maintain it by indisputable facts.

Dr. Pidduck, an English physician of experience,

speaks as follows from his observations on the effects of tobacco at the dispensary of St. Giles :—

"If the evil ended with the individual who, by the indulgence of a pernicious custom, injures his own health, and impairs his own faculties of mind and body, he might be left to his enjoyment, his fool's paradise, unmolested. This, however, is not the case. In no instance is the sin of the father more strikingly visited upon the children than in that of tobacco-smoking. The enervation, the hypochondriasis, the hysteria, the insanity, the dwarfish deformities, the consumption, the suffering lives and early death of the children of inveterate smokers, bear ample testimony to the feebleness and unsoundness of the constitution transmitted by this pernicious habit."

In addition to the maladies already noticed, we might enumerate a large number of other diseases which are either the direct or indirect result of tobacco-using; but the facts we have adduced are ample to warrant the conclusion that the use of tobacco is one of the worst forms of intemperance, and one of the surest means of producing disease. Every proper means ought to be adopted to prevent the contraction of the habit by the young, and to induce those addicted to it to reform.

"*The Devil's Own.*"—Passing a London cigar store one day, we noticed the above words on a flaming placard as the name of a new brand of cigars just produced by the manufacturers. The name impressed us as exceedingly appropriate, and we wondered that so impressive a cognomen had not before been utilized. The cigar is undoubtedly one of the devil's favorite instruments for converting boys who might become respectable citizens and useful men, into loafers, vagabonds, drunkards, and criminals of every description.

Notwithstanding the repeated exposures which have been made of the dangers to life and health incurred by the use of the filthy weed, the number of its devotees seems to be constantly upon the increase. The tobacco habit must be regarded and treated as a moral disease which has fastened itself upon society,—one of "the devil's own" means for degrading and depraving humanity. How perverted, indeed, are the instincts of the human being who deliberately defiles the image of his Maker till every trace of the divine workmanship is obliterated by the scourge of the stinking weed, and he becomes fit only to be labeled "the devil's own"!

How to Reform.—Stop at once. There are very few persons who possess the strength of purpose and power of self-control to "taper off." The tapering off process is far more difficult, and is attended by far greater inconvenience, both physical and mental, than the prompt and complete abandonment of the practice. No fear need be entertained that any risk to life will be incurred, although much nervous irritability and even pain may be experienced. Perseverance for a few days will bring victory, and release from the tyranny of a vile and degrading habit.

GERMS.

IT is supposable, at least, that every man will sometime be at the head of a house, and have the chief responsibility of surrounding his family with the most favorable conditions for health, and guarding them against the encroachments of preventable disease. Modern science has developed the fact that of all the enemies of life and health, the most potent are germs, and to the consideration of these subtle foes to human life this chapter is to be devoted. The following is an abstract of a lecture on the subject, delivered at a Sanitary Convention under the auspices of the State Board of Health of Michigan:—

Germs are invariably connected with organic death, or decomposition.

The various forms of animal and vegetable life which make up the organic world, are constantly passing through the change which we call death. Every living thing, from the delicate fungus which springs up in a night, and fades at the first glance of the morning sun, to the stalwart oak which braves the frosts and gales of centuries, obeys the mandate, "Dust thou art, and unto dust shalt thou return." Every tempest shriek is a wail of woe for the death of a monarch of the forest or a king among beasts. Every leaflet's rustle or brooklet's ripple

is a requiem sung to the death of a million blooming flowers or humming insects. Every instant, countless myriads of creatures in earth, air, and water, fall victims to the great destroyer. The whole world is one vast charnel-house. The soil we tread upon is strewn with corpses. The air we breathe, the water we drink, are often teeming with the carcasses of organic beings that have finished their life work, and given place to a new generation, which will soon meet the same fate as its predecessors.

The universal dominance of death is often used to point a moral lesson, and with telling force it appeals to the sentiments; but to the sanitarian, it has much more than a sentimental significance. Science points out with unmistakable clearness that each death is accompanied by danger to the living as well as misfortune to the victim.

Chemistry brings to light poisonous gases, the presence of which is confirmed by the sense of smell; but the microscope makes a still more important discovery; viz., the presence of myriads of specks of life, to which the name of *germs* has been attached. Wherever decomposition is taking place, these organisms are present in countless numbers. It is perhaps a question whether they are a product of decomposition, or its cause; but it is certain that they are never absent from any process of decay. Infinitesimal in size,—so small that millions may range with unrestricted freedom in the smallest drop of water,—they are yet more potent for harm to human life and health than all other agencies combined. Undoubtedly, these are the active agencies that give rise to dysentery, cholera, diphtheria, yellow fever, the

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plague, to the terrible typhoid fever which annually carries off thousands of victims, and to a long list of diseases whose exact number is not yet known.

There is some difference of opinion respecting the exact nature of the germs which give rise to different diseases, and as to the exact mode of their development and transmission; but it is certainly settled that decomposing matter furnishes a fertile soil for the development of the germ-causes of the diseases mentioned and many others.

Germs and Foul Odors.—Noxious gases and disease-germs are usually associated together,—a fortunate fact, as it enables us to detect the dangerous character of an infected atmosphere without the trouble of a chemical analysis. It is possible for the air to be swarming with disease-germs without an offensive odor being present; but it seldom happens that we have an odor of putrescence without the presence of noxious germs. It is perfectly safe to say that a foul-smelling air is a dangerous air. If our eyes were microscopic, we should daily, hourly, behold sights that would appall the stoutest heart.

Sources of Germs.—Perhaps we may with profit consider for a moment some of the most common sources of these deadly enemies to human life. We need not seek long for an illustration of the source from which these unseen foes sally forth to prey upon our dearest friends, or upon ourselves. Let us picture an average human habitation. We have a fine, commodious dwelling, ample room, plenty of comforts of every sort, every convenience that money can procure or ingenuity devise. It would seem that the occupants ought

to be hale and hearty; but they are not. Every now and then death makes a visit to the household, carrying off its brightest members, ruthlessly slaying father, mother, brother, sister; the strong man, or the feeble infant. Why this sacrifice, this ruthless slaughter? Who are the invisible monsters invading this happy circle? In olden times it would have been said, "An evil spirit hath done this;" but the days of witchcraft and superstition have gone by, and we must look for some more rational solution of the mystery.

A Cellar Investigated.—Let us look around. We will begin our investigation at the lowest portion of the house, and proceed to examine the cellar. The sense of smell at once informs us that a quantity of decaying vegetables has accumulated there, having been undisturbed, perhaps, for months, and are pouring forth into the air deadly emanations, the effects of which have already been described. Through the open cellar door, through the cracks in the floor, through the porous partitions, and through a thousand channels, this stagnant, poison-laden air finds its way to the living-apartments of the household, and into the lungs of the occupants. Every nook and corner of the dwelling is haunted by that pestilential, disease-producing odor.

A Peep into a Kitchen.—We ascend to the kitchen. Here we find an accumulation of what everybody recognizes as kitchen smells. In one corner stands the antiquated wood-box, the mute receptacle of a hundred things besides its daily supply of fuel. If the witnesses were not mute, we might listen to a surprising tale of insanitary transgressions connected with that homely

piece of furniture in the corner. Let us turn out upon the floor the contents, and scrutinize them. Shade of Hygeia, what a smell! The nose makes protest with a sneeze. Suppress your emotions, and proceed to examine. Rotten bark, decomposing apple cores, odds and ends of almost every imaginable eatable, the remnants of the cozy nest in which several generations of mice have been reared, a moldy, putrescent conglomeration of everything perishable that enters a household, teeming with filth, redolent with putrefaction, and crawling with vermin,—such are the contents of the average kitchen wood-box. Not a few such have we seen, and a still larger number, out of sight, but conveniently near, we have smelled.

In another corner is the inevitable "sink," made of wood, and saturated with decomposing "dish-water." Hiding in its secret corners are ancient rags in an advanced state of decay; and the drain-pipe connected with its bottom, affords an open channel for the ingress of pestilential odors from the cess-pool just outside the door.

The plastered walls, saturated with the accumulations of a quarter of a century, pour forth an odoriferous stream of gaseous filth, which is unobserved only because overpowered by the other sources of contamination.

A Pantry Full of Germs.—But we must not omit to take a peep into the pantry close at hand, before proceeding elsewhere with our investigations. I wonder if the goddess of health ever looked into a modern pantry! If she did, it is a marvel that she did not send her emblematic serpent on a commission of punishment among

the cooks, for such flagrant infractions of her laws. Our olfactories are the only guide necessary to enable us to discover the whereabouts of the precious corner where are hoarded the provisions for daily consumption by the family. An odor of sourness, which betrays unmistakably the presence of decomposing milk, leads us to the door-way of the pantry, and we enter to make a closer inspection. With the exception of a few pans of milk which has lost its useful properties, and acquired some which are not useful, all looks neat and orderly; a musty odor not perceptible, perhaps, to those who have become accustomed to it, but apparent and significant to the sensitive olfactories of a sanitarian, attracts our attention to sundry drawers and corners which might otherwise have escaped notice. We will not pain the sensibilities of our hearers with all the possible revelations from an investigation of the hidden recesses of the ordinary pantry. Fragments of moldy bread, stale food of various kinds, perhaps a churn, with its souring, fermenting contents, awaiting the weekly churning-day, are but a few of the items which would be included in a complete inventory. It is a magnificent place for germs of every description to hold high carnival. And they do. Every housewife knows that a pan of new milk placed in a close room or pantry with a pan of sour milk, sours much sooner than if set in a perfectly fresh and wholesome place.

A Sitting-Room Inspected.—Let us take a look into the sitting-room, the chief living-room of the house. Here again we are pretty sure to find a wood-box, nicely painted or papered outside, but no less uninviting inside than its humble brother in the kitchen. We find no

kitchen sink with its unsavory odors, but that source of contamination is within easy smelling distance, and so is still able to do its work of mischief. So, too, the putrescent fumes from the cellar and pantry are plainly perceptible, and the walls are covered with a layer of decomposable matter condensed from the vapors rising from the cooking of vegetables, boiling of soiled garments, and other culinary and domestic operations. Many other such layers have been formed and buried by the new layer of paper and paste added every two or three years, or oftener, until, as we have seen in some instances, as many as eight or ten layers may be counted. Where could a more fertile field for germs or parasitic fungi be found?

A dark spot a foot or two in diameter marks the place where, as the housekeeper says, the paper has been stained as the result of a defective roof. A close inspection shows something more than a stain—a flourishing crop of mold. Put a speck of that same mold under the microscope, and we behold a forest. Every twig bears fine, large, round fruit, which consists of sacs filled with minute specks called *spores*. Some of the sacs are ripe and bursting, throwing the spores with which they are filled in every direction. This is what is taking place on the wall, and those same spores fill the air all around, getting into the dough and making the bread sour, creeping into the fruit cans, stealing into the pantry, and spoiling the labor of the housewife in a hundred ways, besides creating a musty odor, which is constantly inhaled by the occupants of the house, and possibly conveying to them the seeds of disease and death.

A beautiful carpet upon the floor conceals beneath

its delicate shades a conglomerate accumulation of contributions from every source of impurity within the dwelling and without. Let the children romp about the room a few minutes, and see what a cloud of witnesses arise to testify that the shades of death are lurking just beneath its graceful patterns. Every day in the year this "Pandora's box" is compelled, by a vigorous application of the housewife's broom, to send out its miscellaneous store. Each sweep of the broom raises a cloud of germs and spores, and decomposing and decomposable fragments garnered from the kitchen, the yard, the street, the gutter,—a thousand sources, until the air becomes almost as opaque as the densest fog. Every living occupant of the room prudently retires, even to the household cat, except the sweeper, who plies her broom with industrious activity, with head and nose enveloped in the folds of a handkerchief, which acts as a protector and a strainer. When the commotion is ended, the dusty filth settles upon the tops of book-cases, cupboards, and other articles of furniture, among the folds of lace window curtains, upon the ceiling and walls of the room, and wherever it can find a lodgment. Pretty soon the housekeeper comes back, and with a duster stirs up anew the dust which has settled upon tables, chairs, window-sills, picture frames, and other articles within easy reach, driving it up to higher lodgment, from which it is destined to be constantly swept by currents of air, movements of windows, swinging of hanging articles, and in various ways to be breathed, after all, by the daily occupants of the house, who thought to escape by avoiding the commotion created by the morning's sweeping. Such air, like the mines of Nevada, has

"millions in it," all alive, and ready to develop, in a fertile soil, into disease and death.

An Infected Parlor.—But we have not seen all yet. Here is the parlor, with its close, fusty smell, and its chilly dampness. An "odor of sanctity" pervades the place. It is sacred to use on great occasions, when its death-dealing walls are made to witness the still more deadly depredations of a fashionable festival. Upon its cold walls are condensed the steam from kitchen and wash-room, and the organic filth carried with it. "What makes the walls of my parlor sweat so?" has been asked me many times by housekeepers who were annoyed by the dampness of their parlor walls and ceiling, often giving rise to mold and mildew. The explanation is already given. The sunshine never gets into this sacred corner of the dwelling, or at most only a glimmer now and then. Its walls are never disinfected by the sun's full, warm rays. Hence its air is constantly charged with death-dealing properties, which are ready to exhibit their potency whenever favorable opportunity affords.

A Death-Trap.—And there is the parlor bedroom, a veritable death-trap, containing all the dangers enumerated for the contiguous apartments, and more. How many a useful clergyman has been sacrificed at the very hight of his usefulness by incarceration in one of these insanitary bedrooms.

How many an itinerant missionary has arisen from his bed after a night spent in such a place, with rheumatism or consumption fastened upon him. I can easily recall many horrible nights spent in such a place, when boarding round as a district school-teacher, many years ago, and shudder at the recollection.

Unhealthful Sleeping-Rooms.—Let us ascend to the upper part of the house. Here, you may say, we shall find a better condition of things. No kitchen with its foul smells, no pantry with its decomposing food, less dust, and no wood-boxes; but we must not congratulate ourselves too soon. Here is an open stairway in direct communication with the lower rooms; and the heated air from below, which ascends to the apartments above, carries with it its gleanings from cellar, sink, pantry, dusty carpets, moldy walls, fermenting wood-boxes, and the various contributions to the insanitary condition of the house, so that the upper rooms become a receptacle for the overflow from below. Closets, garrets, and unventilated rooms in the upper part of a house become, in time, charged with most virulent enemies to health.

What's under the House?—We have not finished our in-door inspection; but we must hasten, so let us make a survey of the exterior. But before we pass to the out-side, let us pause a moment to ascertain the cause of that peculiar sickening odor which seems to emanate from the hall. The occupants of the house say they noticed a bad smell there last fall, and now, as the warm days of spring are coming on, it has reappeared. What is it? Each member of the family has sniffed it, and scolded at it, and echoed "What is it?" a hundred times. It is not moldy walls nor full wood-boxes; gas from the sink-pipe, nor decaying vegetables in the cellar; sourness from the pantry, nor ancient dust from under the carpet. Possibly it may be something under the floor. No one has ever taken the trouble to look and see, as the space under the floor is not spacious enough for one to visit without considerable inconvenience;

besides, there is no ready means of access to the inclosure except by making a hole through a stone wall, and so the matter has not been investigated. Suppose we step outside, and undertake the task. What do we find? Perhaps a dozen rats who were fed arsenic in the cellar or pantry, and sought out this as a convenient place to die in, or may be maliciously thought to retaliate for their own poisoning by poisoning their destroyers. Perhaps the pet rabbit which mysteriously disappeared a few months ago, apprehending approaching death from surfeiting, has sought this secluded spot to breathe his last, as evidenced by his decomposing remains. At any rate, there is great need of the services of a scavenger, and we wonder how it would be possible to invent a more ingenious contrivance for accomplishing the physical ruin of a family, if such a fiendish design were to be executed.

Sanitary Survey of a Back Yard.—Now let us glance around a little. The front yard is orderly and inviting, of course. Graveled walks, a smoothly cut lawn, a few elegant shrubs and evergreens, all suggest the highest degree of neatness and good taste. Let us step around to the back yard. What a contrast! Close by the door stands a garbage-barrel, which testifies to at least two of the senses that its history goes far back into the dim past. Once a week the milkman comes with a cart, and empties the unsavory receptacle, stirring to the bottom its reeking contents. (Let me whisper in parenthesis that some of the same comes back in tin cans and earthen jars.) Swill-milk is not an unknown article, even in rural districts, where hay and grain bring a good price. At all hours of the day and night this half-rotten receptacle of decomposing organic matter sends out upon the air its filthy emanations.

Near by is a brown looking spot of earth, over which are eagerly crawling myriads of the first insects of the season, and from which ascends a noxious vapor, visible in the cool morning air, but not difficult to discover if not visible, by its pungent, nauseating odor. This, the gardener explains, is the dumping place for the dish-pan and the wash-tub since the drain pipe became clogged, a few months ago. Frozen up during the winter, it was annoying only by its unsightly appearance; but now that the vernal sun has come, the accumulation of months sends forth a constant stream of noisome smells, which are too often experienced to need further description.

A rod or two from the house we notice a little depression in the ground. This, we learn, is the location of the cess-pool. The boards which once formed its roof have rotted away, and allowed the overlying earth to drop into the receptacle beneath, which originally consisted of a bottomless box or barrel, half filled with stones, and connected with the kitchen sink by means of a long wooden box. The wood has how nearly disappeared, a few rotten fragments only remaining. Out of this putrescent hole rises a stench which finds no counterpart elsewhere than in a similar contrivance for domestic poisoning. Horrible, nauseating, loathsome, are faint words to describe the dense vapors which ascend from this repository of liquid filth.

A few feet distant is an edifice which we are at a loss to know how to describe. A correspondent was in the same predicament when he sent us a clipping for publication which he said was "rescued from a place consigned to infamy." The edifice referred to probably

ought to have been consigned to infamy, if it had not been, and the same should be said of most others of the same class. Though carefully guarded from observation by a close lattice, covered by clambering vines, its presence is easily detected, and that without close proximity. How often, as we walk along the streets at night, does the air, which Heaven sends as pure, sweet, and potent with life-giving energies, come laden with poisonous exhalations from dozens of such sources, and freighted with the agencies of death. The vault of an out-house often becomes a much more dangerous enemy to human life than a powder-magazine or a nitro-glycerine factory; yet the latter are by law required to be located far apart from human habitations, while the former is tolerated in the closest proximity to human dwellings, often even under the same roof with human beings.

Death in the Well.—In the midst of all these sources of the most dangerous filth, is located the well, from which is to be daily drawn one of the most essential of the necessaries of life. Is it any wonder that the cup of life is often transformed into the cup of death? Only think of the conditions of a family with Death enthroned in the well, and daily dealing out his poisonous draughts to its members! The mysterious Providence which deprives a family of its loved ones through the agency of typhoid fever, may, in a majority of instances, be proved to be a mysterious connection between the well and a privy vault or cess-pool.

A settler in a new country generally digs two holes in the ground after erecting his humble cottage. Into one goes all the filth, offal, and slops; out of the other

comes all the water for family use. These holes are usually so near together that the contents mingle, so that what goes into one comes out of the other. In an old settled country, a man in making a home digs two or three holes for filth and one for water, so that the latter is often surrounded by the former. As most of the water from the wells is returned to the holes for the reception of filth, a very large share of it may find its way back to its original source,—a very economical arrangement, when the water-supply is short, so far as the water is concerned, but not to be recommended if health and long life are valued.

If we inquire the location of the cistern, we shall very likely find it under the house, and conveniently near the drain-pipe, so that in case of leakage of the pipe, the foul water from the sink may find its way with the greatest facility into the cistern.

At no great distance we may find a stable, with its filthy accumulations, which are drenched at every rain, and contaminate the soil for many feet around, and to an unknown depth. Here is another probable contributor to the water-supply. We have seen scores of wells located in the barn-yard, so as to be convenient for watering the stock, but used for culinary purposes as well, if not in any other way, in the form of milk, beef, pork, or mutton.

Some one may imagine that this picture is highly colored; but the experienced sanitarian will certainly say we have not told half the truth. If our eyes were possessed of microscopic power, we should see about us in many of the houses we visit—perhaps in the very ones in which we reside—a spectacle more surprising

than that which met the gaze of the man of old whose eyes were opened for a moment, enabling him to see a mountain covered with armed hosts who were invisible to his natural eyes. But the hosts we should see would not be an army of brave soldiers coming to our rescue from disease; but the emissaries of death in countless numbers, intent upon our destruction, ready to pounce down upon us at the first favorable opportunity, rack us with pain, and finally devour us.

But what do you know about these germs you talk so much about? says one. Is not this all an hypothesis? We answer, The connection of germs with the phenomena of decay and disease, is something more than an hypothesis. A germ is not an hypothetical thing, like the ether of physical science. Germs have been seen and studied by the aid of powerful microscopes, with the greatest care. Their species, modes of development, favorite habitats, and the conditions essential to their existence, have been worked out with almost as much completeness as the same points with reference to the most common of our higher plants and animals.

Uses of Germs.—Germs play an important rôle in the cycle of existence. Without their agency, the world would soon be covered with the dead but not disorganized carcasses of the millions of animal and vegetable forms which die each instant. It is the function of some of these infinitesimal creatures to reduce back to an inorganic state, animal and vegetable forms which have performed their part in the world, and are no longer of service. The moment an animal or a vegetable dies, even before the last agonies are over, these invisible scavengers begin their work, and their labor is carried

forward untiringly until completed. This is what we call decay, or decomposition. Seal up a decomposable body hermetically, taking care to exclude every germ, and it will keep as long as the receptacle lasts, without the slightest taint. This is what the housewife endeavors to do in the process of fruit-canning. She boils the fruit to destroy the germs it contains, and puts it in the cans while it is yet hot. If the work is well done, it is a success; but if one little germ escapes destruction, the labor is in vain.

These same germs are helpful, in the making of bread. In destroying a portion of the starch of the flour, they occasion the evolution of carbonic acid gas, which, in rising through the dough, makes it light. They are in one sense friendly, since they are the instruments for the removal of a vast amount of dead and useless material which would otherwise soon bury us by its rapid accumulation. Wherever decomposition is taking place, these germs are present in prodigious numbers. One evidence of this is the presence of large numbers of flies in the same localities. The common house-fly subsists largely upon these same germs, as well as the same kind of food as its microscopic congeners. Have you ever watched a fly, or hundreds of them, on a summer day, circling round and round, apparently without any particular end in view? I used to wonder why the little creature should spend its time so aimlessly. The reason is readily found. Catch and kill one, if your conscience will permit you, and put it under the microscope. Observe its wings. These filmy objects, when magnified, present a formidable array of spikes and needle points. Here and there among them

are some of the very germs which we find in the air, in water, in decomposing matter. Now let us dissect the fly, and examine the contents of its stomach. Here also we find great numbers of those same germs.

Now let us watch the little creatures again. Here is one which has been soaring about, and now alights, apparently to rest, upon the window-pane. Watch him a moment. Now he is standing on the forward four of his six legs, and brushing his wings with the hinder two. He brushes a few seconds, then rubs his feet together, then brushes again, and again rubs his feet, then passes something from one hind foot to the middle one, then to the front foot of the same side, then rubs the two front feet for an instant, and brings both feet to his mouth; then he repeats the process. Now he is brushing his head in the same way. Do you suppose he is making his toilet? Quite a mistake. The fly is not so fastidious as to spend so much time over his appearance. He is making a meal of germs. He soars around until his wings are loaded, then rests upon some object while he scrapes them together, rolls them into little balls, and makes a meal of them. Every time you see a fly going through such antics, think of germs, and hunt around for the hot-bed in which they are propagating.

Perhaps there was something more than sentiment in the old nursery rhyme, "Don't kill the fly," etc. But let us not be too hasty in our conclusions. Pretty soon one of those germ-eating flies will come along and put a punctuation mark on the morsel of bread you are about to eat. If you examine that same punctuation mark, you will find it full of germs; and so you are going to eat them after all. The only real service done us by

flies is that of a sort of sanitary thermometer, by which we may judge of the abundance of germs about our premises.

Germs differ in their relations to human life. Some are innocent, some dangerous under certain conditions, others dangerous under all circumstances; and there are some grounds for believing that those which appear the most innocent, and are such under ordinary circumstances, may, under favorable circumstances, become most formidable enemies to human life and health. For example, Drs. Wood and Formad, of Philadelphia, two experts employed by the National Board of Health to investigate the nature and causes of that deadly disease, diphtheria, after many months of close investigation, have submitted their report on the subject, which has recently been published in full by the Board. From this report it appears that one species of the germ, known as *bacteria*, which abounds in the air, where decomposition is abundant, and which is on this account almost always to be found in the saliva of the mouth, may, under favorable circumstances, give rise to diphtheria, thus accounting for the frequent spontaneous appearances of the malady.

Some years ago, Dr. Brewer, of New Haven, Conn., made some experiments on the decomposition of wood, a number of which the author has verified. He found that sawdust, when wet, very quickly undergoes putrefactive decomposition, the process continuing for years, if the wood is kept moist. While undergoing this process of decay, it swarms with the very same variety of germs, or bacteria, found in the throat in diphtheria, which are undoubtedly given off into the air in great

numbers. The same is true of any accumulation of wood exposed to dampness, as uncovered wood-piles, heaps of chips, wooden sidewalks, pavements, etc.

Disposal of Decomposing Matter.—But we must now come to the practical question, What shall we do with this decomposing matter? Its constant occurrence is unavoidable. How can we so dispose of it as to avoid the dangers which have been no more than hinted at in this paper? This question is not a modern one. It was asked and answered, and correctly too, more than three thousand years ago. Moses understood the disinfecting qualities of earth. The city of Jerusalem was provided with sewers. Rome, when in its glory, was well provided for in this direction. A few years since, the author saw in Rome a huge sewer constructed by the Cæsars, and still in use. The same may be said of Carthage, Nineveh, Alexandria, and Herculaneum. During this period, no great plagues prevailed, except in consequence of famine or war. During the Dark Ages, this branch of sanitation was neglected, and great plagues occurred, which again and again nearly depopulated whole countries. In modern times, a revival of sanitary measures has put a check upon the terrible ravages of cholera and the black death, and we scarcely need fear a repetition of the scourges of the middle centuries of our era.

How to dispose of dead matter is a serious and important question. By what means may it be accomplished?

First, and most important, we mention disinfection. A disinfectant is a substance which, when brought in contact with decomposing and decomposable matter, destroys its dangerous properties, and thereby renders it

innocuous. This is accomplished by the destruction of the germs associated with it, if in a state of decomposition, and by a chemical action upon the decaying substance. All excreta should be disinfected with as little loss of time as possible.

What are the best disinfectants?—Dry earth, coal ashes, charcoal, and saturated solutions of the mineral salts, as the sulphates of iron, copper, and zinc,—commonly known as copperas, blue vitriol, and white vitriol,—chloride of zinc, and permanganate of potash or of soda. Each of these has its excellencies, but copperas, the cheapest of all, is also one of the best, and will be most often employed on account of its inexpensiveness. Permanganate of potash is particularly serviceable for household use, especially in the sick-room. Its solution has a deep purple color, which disappears as its disinfecting properties are utilized, thus enabling us to assure ourselves as to the completeness of the work, as I will illustrate by a simple experiment.

How to Disinfect.—The jar which I hold in my hand contains a solution of permanganate of potash, and is, as you observe, of a deep purple color. In my left hand I hold a solution of organic matter in a state of decomposition. Now I add to the contents of this jar a small portion of the purple solution. You observe a slight purple tinge, which quickly disappears as the solution is stirred. As I continue to add portions of the disinfecting solution, the purple color disappears less and less readily, until it remains permanently. Now we know that the solution of decaying matter is fully disinfected, and is no longer capable of doing harm. A quantity of this purple solution ought to be kept on hand in every

household, ready for use in disinfecting the discharges of diphtheritic and fever patients.

This same agent, by the way, affords a very excellent means for determining, with a tolerable degree of certainty, the character of drinking-water with reference to the presence or absence of organic matter. A test solution is very easily made and used. Obtain of any druggist twelve grains of caustic potash and three of permanganate of potash. Dissolve both together in an ounce of distilled or filtered soft water. Add one drop of the solution to a glass of the suspected water. If the color disappears at once, add another, and continue adding until the color remains for half an hour or more. The amount of the solution necessary to secure a permanent color is a very fair index to the quality of the water. If the color imparted by one or two drops disappears in fifteen minutes, the water should be rejected, as probably dangerous. I have been looking around your city for specimens of bad water, the presence of which I find ample grounds for suspecting on account of the porous nature of your soil, and I was rewarded by finding a specimen which I will exhibit to you. You will notice that as I add the test solution, the color disappears rapidly, and a large quantity is required to produce a permanent color. This is very bad water, yet it has been freely used, and we wonder that it has not been the cause of much sickness. It is very possible that many cases of mysterious illness might be fairly attributed to this source. I will not name the source from which this water was obtained, as I have taken pains to see that no further risk shall be incurred, but would advise each of you to obtain a supply of the test-solution, and examine his own well.

Sulphuric and sulphurous acids, together with nitric and muriatic acids, are also good disinfectants. Chloride of lime, if properly used, is very cheap and serviceable; but as commonly employed, it is of no service except to quiet the conscience of the user by producing what might be termed a "sanitary smell." Carbolic acid is also of no value when used in the ordinary way. To be useful, it must be employed in such quantities as to make it very expensive. Bromo-chloralum owes its disinfecting properties to the chlorine and bromine which it contains, and is useful if employed in sufficiently large quantities, which its high price is likely to prevent.

How shall we use these disinfectants? We will give a few hints on this subject as concisely as possible.

Dry earth and coal ashes are best used in the earth-closet, which may consist of an ordinary closet with a box of earth and a shovel convenient for use, or of a closet to which is attached any one of the numerous mechanical devices for applying the earth or ashes.

The following points must receive special attention: The earth must be dry and fine, and must be used in abundant quantities, sufficient to absorb all the moisture, as it is by this means chiefly that dry earth is useful for this purpose. Coarse sand is of little value. Clay, dried and pulverized, is the best of all materials for this purpose. Charcoal, finely pulverized, is useful when applied in abundant quantities, both as an absorbent and by means of its oxidizing properties. It may be used in the same way as dry earth, and the quantity should be sufficient to absorb all moisture. Copperas and the other salts mentioned must also be used freely, if any benefit is expected from them. A solution of copperas, con-

taining at least two pounds to the gallon, should be kept on hand for use. At least a pound of copperas, in solution, should be used each day for a family of ordinary size, or about an equal quantity of blue or white vitriol. When purchased by the quantity, copperas costs but a few cents a pound, and hence may be used freely at small expense.

We need not particularize further respecting the use of other disinfectants, except to remark that in cases of illness from typhoid fever, diphtheria, or any other infectious disease, the discharges of the patient should be received directly into a saturated solution of copperas or sulphate of zinc, or a strong solution of permanganate of potash or soda. White vitriol has the advantage for sick-rooms that it does not stain or discolor garments with which its solution may come in contact.

But what shall we do with decomposing matters after disinfection?—They should be removed as speedily as possible to a considerable distance from any human habitation, particular pains being taken to avoid the vicinity of wells or springs.

We recommend above all other plans for use in rural districts and small towns, the dry-earth system in one form or another. A vault cannot be made safe from danger of contaminating the water-supply unless made water-tight, and then would still be a source of air-contamination, unless a large amount of some good disinfectant were daily employed. If tight at first, it would soon leak, and the disinfection will seldom be attended to.

The dry-earth system is safe, practical, and economical.

The great requisite is co-operation. A man may keep his own premises in a scrupulously sanitary condition, and yet be as much endangered through the carelessness of his neighbor as though he were himself equally careless of the laws of sanitation. "Thou art thy brother's keeper," applies with all its significance in a sanitary sense.

The dry-earth system has been very largely used in a number of European cities, and somewhat in this country, and its practical success is thoroughly demonstrated.

In the year 1875 I introduced this plan into a small city in this State. About one hundred receptacles were put into use. Dry earth and ashes were employed to delay decomposition, and a scavenger was hired to empty the receptacles once a week during the months of April, May, June, July, September, and October. They were regularly emptied twice a week during July and August, and during the most extreme heat of those months, every other day. The results of this small effort were very satisfactory to those who engaged in it. The receptacles employed at that time were shallow pans about two feet square, and four inches deep, made of heavy sheet-iron, and costing about sixty cents each. It was found that the constant contact of a greater or less quantity of fluid excreta occasioned so rapid corrosion of the iron that the pans were rendered useless by one season's use on account of leakage, so that the system was not continued by all who first engaged in it, though many provided themselves with galvanized pans, which were more durable, and a few made large tubs by dividing kerosene oil barrels, with a long, stout

handle attached, by means of which they were drawn out to be emptied and replaced. Four years later, an effort was made in the same community to introduce the "pail system," most of the pans being worn out or abandoned for want of appreciation of their value. Though the effort was made quite late in the season, owing to inability to give the matter attention earlier, a large number of pails were introduced. The size of the pails used was twelve by fifteen inches at the top, nine inches at the bottom, and ten inches in depth. They were made of heavy galvanized iron, were very strong, and cost fifty cents each with the collar, which was attached to the seat to prevent the scattering of excreta upon the ground. The width of the collar was varied somewhat according to the distance from the seat to the pail, this provision being made to accommodate the plan as nearly as possible to the form of construction found in most buildings. The pail rested upon a plain board, upon which were fastened guides to direct it to the proper position.

The pails were managed upon the same plan as the pans, and proved in every way much more satisfactory, being more durable, and much more convenient for handling by the scavenger. The expense of this system is very small. The original cost is a mere trifle, and when a hundred pails or more were in use, the expense for a scavenger was five cents a week for each.

This system has been kept up to a very considerable extent where it was introduced. The great obstacle in the way is the apathy of the people to the necessity of giving attention to this matter.

Another advantage of this system, which we have

not mentioned, is the fact that the removal of the excreta is not at all offensive to the public. The work of the scavenger, usually done at night, is in our opinion often a cause of spreading disease. An odor so strong as to awaken one from sleep in the early morning hours is certainly capable of further mischief.

But there are other forms of decomposing matter. What shall be done with the garbage? Combustion is a good means of disposing of such filth, and relieves the scavenger of an additional burden, and the milkman of a temptation to economize. Fire is the most certain of all disinfectants. This plan is not nearly so troublesome as some may think. If not burned, the garbage may be treated in the same manner as excreta. Wash-water and dish-water should be carried out, and distributed over the soil several rods from the house. Do away with the cess-pool and the vault, and you will abolish two-thirds of the mortality from typhoid fever, diphtheria, epidemic diarrhea and dysentery, and perhaps a number of other diseases. Abolish cellars under houses, and place the house high enough to allow free ventilation and thorough and frequent inspection of the area beneath.

Exchange carpets for hard-wood floors, well oiled and covered, so far as necessary or desirable, with loose rugs, which can be removed and shaken every day. Never allow dust to accumulate anywhere in a house. Banish wood-boxes from the living-room. Never paper a wall over another paper. Let in the disinfecting sun-beams, and plenty of fresh air to every room daily. Never mind if the carpets do fade; better the carpets than the faces of our wives and little ones. In

short, *keep* clean. Keep your premises clean, your dwellings clean, your bodies clean, and your hearts clean, and decomposing organic matter will never do you any harm.

What to Wear for Health.*

THE USES OF CLOTHING.—The several uses of clothing may be said to be, 1. Protection from extremes of temperature, heat or cold; 2. Protection from dampness; 3. Protection of the body from injury through contact with objects; 4. A covering for the body.

In order that these objects shall be met, the clothing must be made of proper material, and must be properly worn. As regards the material for clothing, it is essential, *a*. That it shall be a poor conductor of heat, in order that the heat of the body may not be wasted too rapidly in cold weather, and also that we may be protected from the heat of the sun and highly heated air in summer; *b*. That it shall not transmit moisture too rapidly, as by this means the surface may be too rapidly cooled by evaporation of the perspiration; *c*. That it shall be light, that it may not burden the body with unnecessary weight; *d*. That it shall be porous, or permeable to air, so that the insensible perspiration may escape from the body, and that the process of skin respiration may be properly performed.

*The greater portion of this chapter is quoted from a recent work by the author, a text-book of physiology and hygiene for schools.

Experiment.—A good conductor is a substance which heats readily when in contact with a heated object, or exposed to the fire or the sun's rays. All the metals are good conductors of heat; while wood, hair, and most vegetable and animal substances are comparatively poor conductors. It is for this reason that pieces of wood are often attached to stove handles and flat-irons. Take a short piece of iron rod, and a piece of wood whittled to the same size. Place one end of each against a hot stove cover. In a few minutes the iron will become uncomfortably hot, while the wood may still be held in the fingers, although the heated end may be so hot as to burn. Substances which are poor conductors are termed non-conductors.

What to Wear for Health.—The materials usually worn for clothing are linen, cotton, silk, and woolen, to which must be added leather for shoes, and rubber for shoes and over-garments.

Linen has the advantage of being smooth, soft, and light, but is an inferior material for clothing to be worn next the body, 1. Because it is a good conductor of heat, and 2. Because it readily transmits moisture, and thus promotes evaporation on the surface, and so chills the body. A linen garment feels wet when the least moist or damp.

Cotton is less pliable and soft than linen, but is not so good a conductor of heat, and transmits moisture less readily. It is a better material for clothing to be worn next the skin in warm weather, but is not wholly unobjectionable.

Silk stands next in order of superiority as a material for clothing, being a poorer conductor of heat than cotton, and not so good an absorbent of moisture.

Wool is the best of all materials as a non-conductor, and has the additional merit of absorbing and transmit-

ting moisture slowly, so that a person who perspires freely is less likely to chill than when wearing a fabric of any other material. Wool is also capable of absorbing a considerable amount of moisture without seeming to be wet. The fact that it absorbs water, or "wets" slowly and dries slowly, makes it a most excellent clothing material. However, it is sometimes found to be too irritating to the skin to be worn with comfort. In such cases, a thin cotton or silk garment may be worn under the woolen. This will combine the advantages of the two materials.

Experiment.—Cut two blocks of ice to the same form and weight. Cover one with flannel, the other with cotton cloth. Expose both to the sun, and after an hour or two, weigh each piece of ice and see which has lost the most. It will be found that the woolen cloth is much the best protector for the ice, and for the same reason it affords the best protection for the body.

Another Experiment.—Immerse in water a piece of flannel and a piece of cotton cloth, of equal size. Observe the much greater length of time required for the flannel to become wet. Every one is familiar with the fact that flannel, after being wet, dries very slowly.

Rubber and *leather* should be worn only as a covering for the feet, or for temporary use when exposed to rain. Rubbers and mackintosh cloaks or coats should be laid aside immediately on coming in out of the rain.

Experiment.—Cover the arm next the skin with a piece of rubber cloth, oiled silk, or oiled muslin. After twenty or thirty minutes, remove the covering. Notice that the skin is moist. The moisture is due to the accumulation of the insensible perspiration which ought to have escaped into the air. This shows the importance of wearing porous clothing. Undoubtedly,

many people take cold from the evaporation of moisture which accumulates in the clothing while wearing a rubber cloak or mackintosh, after the rubber garment is removed.

Relation of Color to Health.—The color of garments is usually supposed to be chiefly a matter of taste. This is not the case, however. Experiments show that certain colors absorb and radiate light and heat better than others. Black, brown, and dark colors generally, absorb more heat and reflect less than light colors. White fabrics reflect a large share of the rays of light which fall upon them, allowing some light to pass through, when not too thick, and are very poor radiators. Colors approaching white possess the same properties in a proportionate degree.

Experiments.—Make a box six inches square, leaving one side open. (A pasteboard box will do very well.) Bore an inch hole in the middle of the side opposite the open side. Cover the open side with white flannel. On holding the box up with the flannel toward the sun, and placing the eye at the opening, observe that a considerable amount of light passes into the box. Now remove the white flannel, and put black cloth of the same thickness in its place. On holding it up to the sun, and looking into the opening as before, it will be observed that scarcely a ray of light enters the box. By repeating the experiment with cloths of different colors, a good idea may be formed of the difference between fabrics of various colors as regards their ability to transmit light.

Take three large copper or silver coins. Cover one side of each with black, red, and white cloth, respectively, attaching the cloth by means of a little mucilage. By means of little strips of paper, suspend the coins from the lower edge of a strip of board, taking care to have the covered faces all looking the same way. Now upon the uncovered side of each, place a

small bit of mutton tallow, and hold the strip up to the sun in such a manner that the covered sides of the coins will receive the sun's rays directly, while the opposite side is shaded. Observe that the tallow on the back of the coin covered with black cloth melts first, that on the red-covered coin second, and that on the white-covered coin last. This shows that the coin covered with the black cloth receives the most heat, and the one covered with the white cloth the least. Similar experiments may be made with cloths of other colors.

The same fact may be shown by placing the coins on a smooth block of ice, with the covered faces up, and exposing to the sun. The one that melts into the ice the deepest in a given time, evidently receives the most heat.

It thus appears that from the standpoint of health, white is superior to all other colors at all seasons. In winter it is important to retain as much of the heat of the body as possible, so a poor radiator is required, which a white fabric supplies. In summer it is desired to protect the body from external heat. A good reflector of heat is desirable, which a white fabric also supplies. White garments allow a considerable amount of light to penetrate to the surface of the body.

Dressing for Warmth.—On the whole, a woolen fabric is the best material for undergarments. It should be of fine texture, and preferably of white color. If irritating to the skin, a thin cotton or silk garment may be worn next the body. The underclothing should reach to wrists and ankles, and should be supplemented by warm woolen stockings. The feet should be protected by thick, warm shoes, with tops high enough to afford extra protection to the ankles, which are easily chilled, having less tissue than other parts of the legs.

Many heavy skirts afford much less protection than

half the same thickness, and many times less weight worn in a garment fitted to the body.

Clothing Should be Adapted to the Season and Weather.—More clothing is of course necessary in winter than in summer, but the difference in the amount of clothing required, is less than the difference in temperature. We are all conscious of the fact that we suffer more from a temperature of forty in the summer than from a much lower temperature in winter. This is due to the fact that the system undergoes a change with the season, by which it adapts itself to the new conditions. This change produces what is termed a "winter constitution" for winter and a "summer constitution" for summer. The winter constitution is well adapted to resist cold; while the summer constitution is prepared to resist heat; consequently, the reverse of the conditions for which the body is prepared, are severely felt.

On this account, we need more clothing in summer than in winter, at the same temperature.

The fashion of putting off and resuming winter or summer clothing at certain dates, as is customary with many persons, is a mischievous one. The advice of Boerhaave is applicable to most parts of this country as well as his own. This eminent physician advised that the winter clothing should be put off on a midsummer day, and put on again the next day.

Flannel under-clothing may be worn the year round with advantage by most persons. In winter, several suits of under-garments may be worn, and afford more warmth than the same weight or thickness in a single garment, as the warmth of a garment is due, not so much to its thickness, as to the amount of air which is entan-

gled in the meshes of the fabric, or between its layers. An extra suit of flannel affords almost as much warmth as an extra coat or cloak, and is both cheaper and less cumbersome.

A change from warm to cold weather, or the reverse, at any season of the year, should always be met by a corresponding change in clothing. The outer-garments may remain the same, but the under-garments should be constantly modified as the existing weather may indicate. Observance of this rule will amply repay the slight trouble involved, in the saving of sickness and consequent expense and loss of time.

Secure Equable Warmth.—The different parts of the body should be so clothed that all will be kept equally warm. It is evident that the feet and limbs, being farther away from the heart and great centers of life and heat, must require abundant covering; yet many persons permit them to be so thinly clad in cold weather that they are never properly warm. Their development is checked, and a large part of the blood which they ought to contain is crowded into the head and other organs, which already have a full supply, thus doing double mischief. The absurd manner of clothing little children, exposing the limbs to the cold air, with little or almost no protection, is the cause of much sickness and death among children.

Infants and Aged Persons Need Extra Warmth.—At each end of life the system is less able to provide a proper amount of heat, and extra warmth is needed. Most of the deaths among old people occur in cold weather. Such persons should expose themselves to severe cold as little as possible, and should protect them-

selves by a liberal supply of clothing. It is stated on good authority that in St. Petersburg, where the winter is longer and colder than in most parts of this country, one-third of all the children die before they are one year old, and that one-sixth of the deaths are due to cold.

The Clothing Should Allow Unrestrained Movement.—When worn in such a manner as to interfere with free and unrestrained movement of any part of the body, clothing becomes an embarrassment, and often a cause of disease. Among evils of this kind, and most serious of them all, is the wearing of the clothing in such a manner as to compress any portion of the trunk of the body. Proper clothing requires wholly unrestrained movement of the walls of the chest and abdomen. If the chest or the waist is compressed by tight clothing, the breathing is seriously interfered with, and not only are the lungs rendered liable to disease, but the whole body suffers from the insufficient supply of air. Oxygen is needed to cleanse the tissues; and it is no wonder that the young lady who foolishly laces her clothing tightly, under the mistaken notion that beauty demands a small, round waist for a good figure, loses her clear, rosy complexion, and becomes pale and sallow. The author does not doubt that the corset has destroyed more lives than war or pestilence within the last hundred years. Women have not always been alone in this folly; for according to a reliable author, it appears that English fops of a century ago were as much addicted to the corset as is the fashionable lady of the present day.

Pressure about the waist is harmful in a variety of ways. It not only interferes with the proper movements of breathing, but weakens the breathing muscles

so that it becomes impossible to expand the chest properly, even when the pressure is removed.

Pressure upon the waist also does great mischief by displacing internal organs. The liver and stomach are often crowded out of position, and so cruelly compressed that they become permanently deformed. We have met cases in which examination showed the liver cut nearly in two by this outrageous violation of nature's laws. Under such circumstances, it is impossible that the stomach and liver should be able to do their work properly.

Hanging the clothing upon the hips is a serious evil which must not be overlooked. The internal organs are dragged down out of position, and sometimes permanent injury is done. This is a frequent cause of backache and inability to walk any distance, or go up and down stairs, without great fatigue. Girls, as well as boys, should wear all their clothing suspended from their shoulders. Some years ago, the Russian government passed a law compelling the soldiers to wear suspenders, it having been found that the wearing of pantaloons hanging upon the hips and suspended by a belt, which was the usual custom, was a grave cause of dyspepsia. The German laboring women, who are in other respects remarkably strong, suffer much from the evil practice of wearing many heavy skirts suspended from their hips.

It must be remembered, however, that the shoulders, while the proper organs for bearing the weight of the clothing, are not capable of carrying an unlimited amount. Warm under-clothing obviates the necessity for heavy skirts, which afford little warmth, and are an

incumbrance in walking. Unnecessary weight in clothing should always be avoided. The strength expended in carrying extra clothing which is not needed for the comfort or convenience of the body, is worse than wasted, and detracts from a person's available strength for useful employment. No apology can be offered for the long, heavily trimmed dresses worn by women, and it is to be hoped that the intelligent women of the country will combine their efforts to bring about a change for the better in this respect.

Freedom of movement requires that the clothing should not be too tight about the shoulders, and so made that the arms may be extended above the head and in all directions without restraint. Garters for the limbs and elastics for the arms are to be avoided, as they interfere with the circulation.

Experiment.—Tie a cord tightly around the finger, and in a few moments it becomes swollen and cold. The venous blood accumulates in it, and new, warm, vitalizing blood is kept out. The tighter the cord, the more marked the effect produced. Constrictions about the limbs of any sort produce the same result, to some extent, and so occasion injury.

Clothing for the Feet.—Proper clothing of the feet is a matter of no small importance, as many diseases arise from their being improperly clad, and from the wearing of shoes or boots of improper shape. Shoes or boots with thin soles, worn in damp weather, allow the soles of the feet to become damp, or at least to be chilled, by walking on cold, wet pavements, and in this way persons often take severe colds without really getting the feet wet. The sole of the shoe should be thick. Shoes with rubber soles are now manufactured in Eng-

land, and may soon be introduced into this country. They are much to be preferred to the ordinary shoe, as they protect the foot from injury through damp and cold side-walks, besides giving a more secure footing in icy weather. The upper should be soft and pliable, and should fit the foot so perfectly that no discomfort will be experienced the first time the shoe is worn. Tight shoes or boots prevent the proper circulation of the blood in the feet, and produce corns, bunions, swellings, and sometimes still more serious diseases of the feet.

Clothing of the Neck and Head.—The clothing of these portions of the body is by no means a matter of small consequence. A very large share of colds and sore throats are the result of exposure of the head and throat. If the head and throat were never covered, they would learn to take care of themselves; but if covered a part of the time, and then occasionally exposed, serious mischief may result. Coverings for the head and throat should be sufficient, but not so warm as to cause perspiration, as this will insure taking cold. Persons who "coddle" themselves most are the ones who are most liable to colds. It is well to accustom one's self to endure a certain degree of cold; and when this "hardening" process is conducted properly, it is quite wonderful to what an extent the system is able to defend itself against cold. Travelers say that many of the natives of Terra del Fuego wear no clothing, although there is frost at all seasons of the year. Even the little children run about naked with the temperature at 40° F. The ancient inhabitants of England wore no clothing but paint, yet, according to historians, were able to endure the most severe cold.

Persons who have the head covered during the day, and at night sleep in cold rooms or with a window open, should wear a night-cap in cold weather. The head ought not to be covered except when really necessary, as it is heated, and thereby rendered sensitive, in consequence of which the hair may become diseased and fall away. Many cases of baldness originate in this manner.

Change of Clothing.—The clothing, especially that worn next the skin, absorbs a large amount of the waste matter thrown off by the skin, and so becomes charged with impurities. On this account, the clothing should be changed not less often than once a week in the winter; and in the summer season, and at other times when the skin is unusually active, health will be promoted by a daily change. An excellent plan is to have two suits of under-clothing, wearing each on alternate days, allowing the one not worn to be exposed to the air in the meantime. In cold weather, the comfort of the feet, if inclined to be cold, will be greatly promoted by the adoption of this plan with the stockings, if not with the other under-garments.

Night-Clothing. — The clothing worn during the night should exclude every article worn during the day. In winter time, a long woolen gown is as necessary for health as for comfort. When the feet and extremities are cold at night, woolen bed socks or leggins may be needed in addition.

Beds.—The bed-clothing should be dry and warm. A cold bed is necessarily a damp bed, as it condenses moisture from the body of the sleeper as well as from the air of the room. A damp bedroom becomes musty. Thus a person sleeping in such a bed is not only debili-

tated by the loss of animal heat, but is poisoned by the inhalation of the musty, germ-laden air which he is compelled to breathe during at least a third of the twenty-four hours. A sleeping-room should always contain a stove, unless heated by a furnace or from an adjoining and communicating room. The bedroom should not be too warm, but should be heated sufficiently to insure dryness.

Bed-clothing and mattresses should be thoroughly aired daily, and should be exposed to the direct rays of the sun whenever possible. The Italian custom of leaving the bedding exposed to the air during the entire day is a good one. By this means the excretions accumulated from the body during the night are mostly removed.

Bed-clothing should be of porous material; otherwise the skin cannot breathe any more than could the lungs with a rubber blanket thrown over the head and gathered tightly about the neck. Porous coverings also allow the escape of the greater portion of the moisture excreted by the skin, which amounts to not less than half a pint to a pint during the night. Several thin coverings are much better than one or two heavy comfortables. Woolen blankets are most suitable, being both light and warm as well as porous.

Feather-beds absorb so readily and retain so tenaciously the exhalations of the body, that they are regarded by sanitarians with suspicion. If used, they should be thoroughly renovated at least as often as every six months, and should be daily exposed to the air and sun for two or three hours. It is much better to discard them.

The length of time spent in bed, usually not less than one-third of our whole lives, makes it important that all matters pertaining to the hygiene of the bed and the sleeping apartment should be attended to with very great care and thoroughness.

In this connection, it is proper to mention the dangerous habit which children sometimes have of sleeping with the head covered by the bed-clothing. Fear of the dark, excited by stories of impossible ghosts and improbable robbers, is frequently the cause of this practice. The air under the bed-clothing soon becomes very poisonous, and it not infrequently happens that children who are addicted to the practice go to sleep never to wake, being found by their parents in the morning smothered to death.

Poisonous Colors.—Numerous cases have occurred in which serious illness, accompanied by painful inflammation of the skin, has arisen from wearing articles of clothing colored with poisonous dyes. Flannel undergarments, stockings, and colored hat-bands have been the most frequent sources of the poison. Red and other aniline colors are most likely to be poisonous; but cases of this sort are now less frequent than formerly.

How to Bathe.

IN water, nature has supplied us with one of the most efficient means of aiding her in the restoration of the sick to health, as well as one of the greatest necessities of life. Properly used, this remedial agent is capable of accomplishing more for a person suffering with the special maladies described in this work, than any other one remedy, or than all the drugs offered by the entire *materia medica* combined. It is possible, however, that this beneficent agent may do harm as well as good, and hence it is important to know how to employ it in a rational and scientific manner.

General Rules for Bathing.—The following general rules apply to nearly all baths of every sort:—

1. A full bath should never be taken within two or three hours after eating.

2. Always, if possible, employ a thermometer to determine the temperature of the bath.

3. The temperature of the room during the bath should be 75° to 85°.

4. Aged people should never take very cold or very hot baths.

5. Never take a cold bath when exhausted or chilly.

6. A hot bath should always be followed by an application of water at a little lower temperature.

7. Always drink freely of hot water just before a warm bath.

8. It is usually best to wet the head before a bath.

9. Always be careful to dry the skin thoroughly after a bath.

10. The body should be rubbed with sufficient vigor after each bath to secure a good reaction, and to prevent a feeling of chilliness.

11. After a cool bath, exercise a little to encourage the circulation. After a warm bath, rest for an hour or so.

Sponge Bath.—The sponge, or hand bath is the simplest and most useful mode of applying water to the surface of the body, for it requires the use of only such appliances as every one possesses, and it can be employed by any one without elaborate preparation, and under almost any circumstances. A great quantity of water is not required; a few quarts is a plenty, and a pint will answer admirably in an emergency. A soft sponge, or a linen or cotton cloth, and one or two soft towels, or a sheet, are the other requisites. The hand may be used in the absence of a cloth or a sponge for applying the water.

The temperature of the bath should not be above 95°, and 90° is generally better. Most people can habitually employ a temperature of 75° or 80° without injury. The use of a much lower temperature is not commonly advisable, and is often productive of great injury.

Begin the bath as usual, wetting the head, and saturating the hair well. Wash the face, then the neck,

chest, shoulders, arms, trunk, and back. Rub vigorously until the skin is red, to prevent chilling; for even when the temperature of the room is nearly equal to that of the body, the rapid evaporation of water from the surface will lower the external temperature very rapidly, unless a vigorous circulation is maintained.

After thoroughly bathing the upper portion of the body, turn the attention to the lower portion, continuing the rubbing of the upper part at brief intervals, to prevent chilliness. As soon as the bathing is concluded, envelop the body in a sheet, and rub dry, or dry the skin with a towel. When the surface is nearly or quite dried, rub the whole vigorously with the bare hand.

The bath should not be prolonged more than ten or fifteen minutes. Five minutes is sufficient to secure all the benefits of the bath, and even three minutes will suffice for a very good bath.

Persons who chill easily will find it better to bathe only a portion of the body before drying it. Some will even find it necessary to retain a portion of the clothing upon the lower part of the body while bathing and drying the upper part.

Weakly patients may receive this bath with very little disturbance, even in bed. Only a small portion of the body should be uncovered at a time, being bathed, dried, rubbed, and then covered while another part is treated in a similar way.

The sponge bath may be administered anywhere without danger of soiling the finest carpet, by taking care to make the sponge or cloth nearly dry before applying it to the body. A rug may be spread upon the floor as an extra precaution. When used for cleanli-

ness,—as it should be daily, or at least two or three times a week,—a little fine soap should be added two or three times a week, to remove the oily secretion from the skin.

This bath is applicable whenever there is an abnormal degree of bodily heat, and in such cases may be applied every half-hour without injury, and even more frequently. It is useful in cases of nervousness and sleeplessness, in chorea and *laryngismus stridulus*, also in that curious affection of children known as "catch in the breath." In fact, whenever water is required in any form, this bath may be used with advantage, the temperature being suited to the case. Sponging with water as hot as can be borne will often relieve for several hours the profuse sweating of consumptives. Hot sponging of the face, neck, and head are useful in relieving the headache of catarrh and influenza, and in stopping nose-bleed.

For a saline sponge bath, add a tablespoonful of salt to each quart of water employed in the bath.

Full Bath.—For this bath, a tub is required the length of the body, about eighteen inches deep, two feet wide at the top, and, preferably, six inches narrower at the bottom. It is better to have the end intended for the head a little elevated. Place in the tub sufficient water so that the patient will be entirely covered, with the exception of the head, when he lies upon his back. During the bath, the body should be vigorously rubbed by the bather or an attendant, or both, particular pains being taken to knead and manipulate the abdomen in a gentle but thorough manner. The temperature of the bath, when taken for cleanliness or for its soothing

effects, should not be higher than 95° to 98°, and it should be cooled to about 85° or 90° just at the conclusion of the bath, by the addition of cool water.

Very cold baths are used by some, especially in Germany, in the treatment of fevers, so low a temperature as 60° F. being often employed. The most approved mode, however, is what is called the graduated bath, in which the temperature is gradually lowered until the desired effect has been produced.

When used to excite the action of the skin, a hot bath should be employed. Begin the bath at 98° or 100° F., and gradually raise to 108° or 110°, continuing for ten or fifteen minutes. Then remove the patient, wrap him in blankets, and let him remain sweating half an hour to an hour.

Every family ought to possess conveniences for a full bath. Indeed, it is now found in every well-regulated house in our large cities. It is not so expensive but that any man can have it. Portable baths of rubber may be obtained, which are worth many times their cost. A stationary bath may be made of wood, of the dimensions given, and lined with lead or zinc. There should be an opening in the lower end for withdrawing the water.

The full bath is one of the most refreshing of all baths, being also one of the pleasantest. Employed at a low temperature, it is a powerful means of reducing excessive heat in fevers. The hot full bath very greatly relieves the pain of acute rheumatism, colic, gall-stones, and sciatica, and is almost a specific for colds, if taken soon after their contraction and just before retiring.

Very hot and very cold temperatures are very haz-

ardous with this bath, since it involves so large a portion of the body. Such extremes are rarely useful in any case, and should be used only under the eye of a physician. We have found that the cold bath is very much better borne if the patient is well anointed with vaseline before being placed in the water. The effects are not diminished.

Sweating Pack.—Wrap the patient in woolen blankets. Place to his hands, side, thighs, and feet, hot bricks, or jugs filled with hot water, wrapped in moist flannels. Beer bottles filled with hot water and covered with wet stockings, are very convenient. Give frequent and copious draughts of hot water or some simple tea, as peppermint or wintergreen, or some similar drink. Keep the head cool by tepid compresses. In a few minutes, most copious perspiration will be produced. After the bath, treat as after a pack. This is useful in all cases in which powerful action of the skin is desirable, as in chronic rheumatism, obesity, jaundice, etc. It is one of the most excellent means of curing a cold.

The Vapor Bath.—As a remedial agent, water in the form of warm or hot vapor is scarcely less useful than in its ordinary form. The vapor bath can be readily and successfully administered with such conveniences as every family possesses. Place the patient in a cane-seated chair, having first taken the precaution to spread over the seat a dry towel. Surround the patient and the chair first with a woolen blanket, and then with two or three thick comfortables, drawing the blankets close around the neck, and allowing them to trail upon the floor so as to exclude the air as perfectly as possible. Now place under the chair a large pan or pail containing

two or three quarts of boiling water. Let the blankets fall quickly, so as to retain the rising vapor. After a minute or two, raise the blankets a little at one side, and carefully place in the vessel a very hot brick or stone, dropping the blankets quickly, to avoid the admission of cold air. Before the first brick or stone has cooled, add another, and so continue until the patient perspires freely. The amount of perspiration must be judged by the face and forehead, as much of the moisture upon the skin beneath the blankets is condensed steam.

Should the bath become at any time too hot, a little air may be admitted by raising the bottom of the blankets a little, being careful to avoid chilling the patient in doing so. The bath should seldom be continued more than half an hour, and fifteen to twenty minutes will usually accomplish all that is desired by the bath. If too long continued, it produces faintness. A too high temperature will be indicated by a strongly accelerated pulse, throbbing of the temples, flushed face, and headache. The head should be kept cool by a compress wet in cool water and often changed. The temperature of the bath should be from 100° to 115°. Unpleasant effects are sometimes produced at 120°.

After this bath, apply the tepid sponge or full bath. No time should be allowed to elapse after the blankets are removed before the concluding bath is applied, as the patient will easily chill. He should not be allowed to become chilly by exposure to cool air before the application of the spray, douche, or other bath, which should be followed by vigorous rubbing.

For "breaking up a cold," "breaking chills," relieving rheumatism, soreness of the muscles from overexertion,

and relaxing stiffened joints, this is a valuable agent. It may also be used to advantage in chronic diseases in which there is inactivity of the skin, liver, or kidneys, being a powerful diaphoretic; but great care must be exercised to avoid excessive use, as too frequent repetition of the bath produces debility.

This is a milder application than the hot-air bath, unless employed at a high temperature, 120° or more, when it becomes more severe.

In an institution where the bath is a daily necessity, a permanent arrangement for giving the bath is generally employed. It usually consists of a box in which the patient sits upon a stool, his head being allowed to remain outside by means of a suitable opening. A wet towel is placed around the neck, to prevent the steam from rising about the head.

Steam may be generated by boiling water in a box with a large spirit lamp or a gas burner, or it may be conducted into the bath by a rubber tube connecting with a tight boiler.

After this bath, a little cold water should be dashed over the body to tone up the skin; or if continued sweating is desired, the patient should be wrapped warmly in bed, with woolen blankets next to the skin.

Hot-Air Bath.—In administering this bath, prepare the patient precisely as directed for the vapor bath. Instead of placing under the chair a vessel of hot water, place a large alcohol lamp or a small dish containing a few ounces of alcohol. When all is ready, light the lamp or alcohol, and carefully exclude the air. It is hardly necessary to suggest the propriety of putting the lamp in such a position as to insure safety from fire. If

alcohol is used in an open dish, it is important to wipe the outside of the vessel quite free from any trace of alcohol, as otherwise it might be communicated to the floor or carpet. Also avoid spilling the alcohol in putting the lamp or dish in place, for the same reason. It is a wise precaution to put the lamp or dish in a plate or shallow dish containing a little water. The hot-air bath should be conducted in the same manner as the vapor bath; but the patient will bear much higher temperatures, as air is a much poorer conductor of heat than vapor. A heat of 130° to 160° F. is not at all disagreeable to the patient. It should be followed by a cooling bath, as directed for the vapor bath. When perspiration is not readily produced by the hot-air or Turkish bath, the patient should be given a hot full bath from three to five minutes, and then again exposed to the hot air, when perspiration will quickly start. The vapor bath may be used for the same purpose.

This bath is useful for all cases in which the vapor and Turkish baths are recommended, and is most convenient for use in families, as it can be improvised so readily. It cannot be excelled as a diaphoretic, and is an excellent means of eliminating the poison of malaria, syphilis, and hydrophobia. An English naval surgeon reported through the *British Medical Journal*, a year or two ago, a large number of cases of syphilis successfully treated by the hot-air bath, combined with a careful diet.

The Oil Bath.—The oil bath was much employed by the ancients in connection with the Roman and Turkish baths. It consists in rubbing the skin very thoroughly with some unctuous substance. Olive-oil

may be employed, but cosmoline and vaseline, refined products of coal-oil, are much used, and are preferable. Olive-oil cannot be obtained pure except at almost fabulous prices. That sold in the drug stores as olive-oil, is really cotton-seed oil, and mixtures of lard with various other vegetable oils. We have found pure refined cocoanut-oil to be the best of all for this purpose.

A warm bath should be first administered. Then dry the patient as usual, and apply the unguent, taking care to rub it in thoroughly. Simply greasing the surface is not the object sought. The skin and flesh should be worked, rubbed, and kneaded, until the oil nearly disappears from the surface. The skin should then be wiped clean with a soft cloth.

The object of this application is to supply the place of a defective natural secretion of oleaginous material, to increase the activity of the skin, and to diminish the susceptibility to cold. How this is accomplished, readily appears. The oil is a simple substitute for the sebaceous secretion, which is, in certain classes of diseases, notably deficient. The thorough manipulation of the skin which is necessary in applying the oil, and which is facilitated by a lubricant, directly promotes cutaneous activity. Whether the oil itself has any direct effect in increasing functional activity of the skin, cannot be positively affirmed, although it is reasonably supposable that the skin would act more nearly normal when a deficient element is supplied than when it is wanting. Recent experiments show that the skin radiates heat faster when varnished or anointed, and this may account in part for the warming effect of the oil bath, as also for the protection it affords against taking cold after warm baths.

Sitz Bath.—The sitz bath, also known as the hip bath, is one of the most useful baths employed in hydropathic treatment. Its utility was fully recognized by the early practitioners, who sometimes kept their patients so long in the bath that they became almost literally water-soaked, and were so numb from the continued application of cold water as to possess almost no external sensibility. It is said in some cases the skin could be rubbed off in attempts to gain a reaction, without the patient's knowledge.

For this bath, a common tub may be used, by placing a support under one edge to elevate it one or two inches; but it is better to use a tub made for the purpose, which should have the back part raised eight or ten inches higher than the front, to support the back, the sides gradually sloping so as to support the arms of the bather. The bottom should be elevated two or three inches. The depth in front should be about the same as that of a common wash-tub.

Enough water is required to cover the hips, and extend a little way up the abdomen; four to six gallons will suffice. Any temperature may be employed, being suited to the condition of the patient. The duration of the bath will also vary according to the condition of the patient. A short, cool bath is tonic in its effects, like all short, cool applications; a more prolonged one is a powerful sedative. The hot sitz is very exciting in its effects, if long continued. The warm bath is relaxing. The hip and trunk should be well rubbed during the bath by the patient or an attendant. The bather should be covered with a sheet or blanket during the bath. If sweating is desirable, use several blankets.

The sitz bath should seldom be taken either very hot or very cold. A good plan for administering it, and one which will be applicable to most cases, is this: Begin the bath at 92° or 93°. If a thermometer is not at hand, pour into the bath-tub three gallons of fresh well or spring water, and then add one gallon of boiling water. This will give the desired temperature. After the patient has been in the bath ten minutes, cool it down to 85°, which may be done by adding a gallon of well-water. Continue the bath five minutes longer, then rub the whole body vigorously with the wet hand, and wipe dry.

The sitz bath is useful for chronic congestion of the abdominal and pelvic viscera, diarrhea, piles, dysentery, constipation, and genital and urinary disorders. It is very valuable in many nervous affections, especially those which involve the brain, as cerebral congestion and hyperæmia. There is no better remedy for a cold than a very warm sitz bath taken while fasting and just before retiring. It should be continued until gentle perspiration is induced.

Wet Girdle.—This was a favorite remedy with the early German hydropathists, and it is a very useful appliance when properly employed, though it has been much abused by excessive use. To apply it well, a coarse towel three or four yards in length is most convenient for use. Wet one-half of this in tepid water, wring it until it will not drip, and apply it to the abdomen, placing one end at the side and bringing it across the front first, so that two thicknesses of the wet portion will cover the abdomen. After winding the whole closely around the body, fasten the ends securely with

pins or with tapes attached for the purpose. Then cover with two or three thicknesses of dry flannel. For feeble persons, it is better to wet only that portion of the towel which covers the abdomen. This is a very efficient remedy for constipation, chronic diarrhea, and most intestinal disorders. It is equally valuable in dyspepsia, torpid liver, enlarged spleen, and uterine derangements.

The Enema.—Fecal accumulations in the lower bowel are more quickly and easily removed by an enema of warm water than any purgative, laxative, or cathartic ever discovered or invented; and the use of this remedy is not accompanied by the unpleasant and painful griping and tenesmus which often attend the use of cathartics. The administration is a trifle more troublesome, but the results are enough superior to more than repay the inconvenience. The syphon or fountain syringe is far preferable to any other for administering injections. Water about blood-warm should be used for the purpose of relieving constipation, and a considerable quantity—one to three pints, or more—may be used. The water should be retained for a few moments while the bowels are kneaded and shaken. If there is difficulty in retaining the enema, a folded napkin may be pressed against the anus. In hemorrhage and inflammation of the lower bowel, cool or cold clysters should be employed, and should be retained as long as possible. The copious cool enema is a valuable antiphlogistic remedy used in conjunction with the cool bath in cases of violent febrile excitement, as typhoid fever, when the temperature rises above 103° F. It is also useful in certain cases of spermatorrhœa.

The enema is a most perfect substitute for purgatives in general. Cases are very rare in which a cathartic drug will be found necessary if the enema is properly used. But the enema may become a source of mischief if abused. If habitually relied upon to secure a movement of the bowels for a long time, the bowels lose their activity, and the most obstinate constipation sometimes results, precisely as from the prolonged use of purgatives.

Compresses.—The compress is a wet cloth or bandage applied to a part. The object may be to cool the part under treatment, or to retain the heat. The compress may be used with equal success in either case. When the part is to be cooled, a compress composed of several folds should be wet in cold or iced water, as required, and placed upon the part after being wrung so it will not drip. It should be changed as often as every five minutes. This is often neglected, to the injury of the patient. A very cold compress may be prepared by placing snow or pounded ice between the folds of the compress. This will not need renewal so frequently; but its effects must be carefully watched, as injury may be done by neglect. In applying cold to such delicate parts as the eye, a very thin compress is better. It should be renewed once in five minutes, at least.

When moist warmth is required, a thick compress should be used, being wrung out of tepid water, and covered with a dry cloth to exclude the air. Soft, dry flannel is an excellent covering. Rubber or oiled silk may be employed when the compress is not to be retained more than a few hours; but if it is to be worn continuously, they will be injurious, as they are impervious to the air, and thus interfere with the function of the skin.

The effects of a compress thus employed are identical with those of the poultice, and the application is a much more cleanly one.

Compresses are applicable to all cases in which poultices are commonly used. They may replace the old-fashioned plasters with profit and comfort to the patient.

Fomentations.—This is a mode of applying moist heat by means of a flannel or sponge wet in hot water. The fomentation is a local application analogous to such general appliances as the hot pack, vapor bath, and hot-air bath. It consists in the application of a cloth wet in hot water. It may be considered as a hot compress. Fold a soft flannel cloth so that it will be of three or four thicknesses. Lay it in a basin, pour boiling water upon it, and wring it dry by folding it in a dry towel. Or, if only one end of the cloth is wet, it may be wrung by folding the dry portion outside of the wet; in wringing, the whole will become equally wet. Apply it to the patient as hot as can be borne. The second application can usually be made much hotter than the first. Frequently dipping the hands in cold water will enable the attendant to wring the cloths much hotter than he would be able to do otherwise.

A better way is to fold the flannel as it is to be employed, and then dip in very hot water, lifting it out by the corner, and placing it in the middle of a towel. Roll up quickly, lengthwise of the towel, and wring nearly as dry as possible by twisting the ends of the towel. In this way the fomentation can be wrung out much hotter than with the hands. Of course it will be too hot to apply to the bare flesh; but do not waste heat by letting it cool. Protect the skin by one or more

thicknesses of flannel, and apply at once, covering with another dry flannel. The fomentation will gradually warm through, and will retain its heat two or three times as long as when applied in the ordinary way.

The hot cloths should be renewed once in two to five minutes. Two cloths should be employed, so that the second may be applied as soon as the first is removed. To retain the heat, a dry flannel, rubber, or oil-cloth should be placed over the fomentation. The application may be continued for ten minutes to half an hour, or longer in special cases.

This appliance is very powerful, and should not be employed to excess.

Alternate hot and cold fomentations are frequently more efficient than the continuous fomentation. Hot applications should generally be followed by the cool or tepid compress for four or five minutes, or the part should be briskly rubbed by the hand dipped in cold water, until the redness produced by the fomentation in part disappears. In neuralgia, gout, and chronic rheumatism, in which the cooling has a tendency to cause the return of the pain, the parts should be covered with dry, warm flannels, and so protected from the air. By this means, the good effects of the application may be prolonged.

When applied to the head for some time without intermission, it will often occasion faintness; hence a cooler application should be made after the use of hot cloths for fifteen or twenty minutes.

If the applications must be continued for a long time, it is well, in most cases, to employ them at a temperature slightly lower than when they are to be used for only a few minutes.

The uses of the fomentation are very numerous. It is indicated whenever there is local pain without excessive heat or evidences of acute inflammation. Local congestions, neuralgia, toothache, pleurisy, and most local pains, vanish beneath its potent influence as if by magic. For indigestion, colic, torpid liver, dyspepsia, constipation, and rheumatic pains, it is a remedy of great power, and is used with almost uniform success. In relieving sick headache, by application to the head, back of the neck, and the stomach, its efficiency is unrivaled. The fomentation is also extremely useful in cases of great loss of blood, in which fatal fainting may be prevented by making a hot application to the head, and so encouraging the circulation of blood in the brain.

SEXUAL SINS

AND THEIR CONSEQUENCES.

NATURE has guarded all the laws which she has made for the government of the functions of the human body by means of severe penalties, which are certain to be visited upon the reckless individual who lives in heedless disregard of the laws of health; and no form of physical transgression is followed by such terrific and unmitigated penalties as those which we are to consider in this chapter under the head of "Sexual Sins."

SELF-ABUSE, OR MASTURBATION.

Self-abuse, or masturbation, is probably the most common, and certainly one of the most damaging, of all forms of sexual vice. The nature of the practice is unfortunately too well known to require any precise description, and it will suffice to say that it consists in exciting the genitals by mechanical means of some sort. There are, of course, no accurate statistics wherewith the extent to which this vice prevails may be determined; but there can be no doubt that the evil far exceeds in

magnitude the estimates of those whose opportunities for observation have not been such as to give them an adequate idea of this dreadful physical and moral blight. For many years, the author has occupied the position of superintendent of one of the largest medical establishments in the world, which has afforded him opportunities for gaining information on this subject that has convinced him that very few persons indeed properly understand the extent to which this evil prevails; and the results of many years' observation and very extensive research have convinced him that the vice has come to be, among boys at least, almost universal. He does not wish to be understood as intimating that there are not many noble exceptions. Undoubtedly, there are boys who escape the moral contamination which often leads to the formation of this habit at a very early age, but their number must be very small when compared with the great multitudes who, often at the very threshold of life, are introduced to this soul and body destroying vice. Somewhat extensive inquiry during travels in England and Continental Europe a few years since, led the author to believe that the vice is somewhat less commonly practiced, at least among the peasantry of European countries, than in this country, which is perhaps due to the greater simplicity of habits, particularly in diet, and the forced habits of industry to which the young of both sexes are educated from a very early age, in the countries referred to. A medical author of some prominence declares that in Russia the practice is universal among the young of both sexes.

That the practice prevailed, to some extent at least, in ancient times, is evidenced by the frequent allusions

to it in the writings of ancient medical authors. Hippocrates, the father of medicine, refers to the practice, and describes the terrible consequences which follow its indulgence under the name of *tabes dorsalis*, a picture of which he draws, and as faithfully portrays the condition of the unfortunate victims of this horrible vice as if the description were written by a modern medical author, instead of the great Grecian physician who flourished more than two thousand years ago.

The vice of self-abuse seems to be almost entirely confined to the human species. It is readily acquired, however, by some animals, particularly the monkey, though it is doubtful whether in this case the animal has not been instructed by some vicious human being.

Causes of Self-Abuse.—First of all causes which may be mentioned, are evil associations. No better illustration of the language of the Bible, "Evil communications corrupt good manners," can possibly be found than is afforded by the constant propagation of this fearful evil through evil associates. Both public and private schools afford excellent opportunities for corrupt lads to contaminate their fellows; and that these opportunities are well improved, may be confirmed by the testimony of almost any school-boy. Probably there is not one boy in fifty, above twelve years of age, in attendance at our public schools, who does not know more or less of this degrading vice, having gained his information, perhaps, at a very early age from some evil associate. Primary schools are often nurseries of vice as well as of learning, and the author has had good reason for believing that in some schools of this class the vice has prevailed so extensively that scarcely a single pupil has es-

caped its blighting influence. A boy of tender years is sent to one of these schools from the seclusion of home, where he has been carefully guarded from every taint of vice and vulgarity, and is almost instantly set upon by boys of his own age or older, and instructed in the filthy practices in which they are already adepts. The little fellow, ignorant of the nature of the vice, falls an easy prey to it, and only learns the evil, physical and moral, when he has become so thoroughly entangled in the toils of the habit as to make escape all but impossible; or when, at a still later hour, he awakens to the fact that his manhood is gone, his intellect weakened, and himself become a physical, mental, and moral wreck.

Boys are sometimes led astray by this alluring vice, even before they are sent to school. Fond parents may imagine that because their children are not allowed to run upon the streets, are kept from the public schools, and carefully guarded within the precincts of home, they certainly must be pure and free from this all-destroying vice; but we have often discovered its existence in small boys whose parents were ready to stake their lives upon their innocence, so blind and ignorant were they respecting the possible sources through which contamination might come. Visits from neighbor's children, allowing boys to sleep with other boys of their own age or older whose habits are not known, a casual acquaintance formed in the back yard, through the garden fence, —all these opportunities may be sufficient to sow the seed of physical and mental ruin.

Sometimes children yet "in arms," even nursing infants, are taught the vile practice by ignorant or wicked nurses. In some European countries, nurses habitually

resort to this means of quieting troublesome infants; and we have met some instances in which this reprehensible practice had been resorted to by nurses in this country. The horrible results of such a practice may be more readily imagined than described in these pages, and the possibility of the evil's originating in this way should lead mothers to exercise the greatest caution in the selection of those who are to have the care of their children, even those of the tenderest age. Those who are themselves addicted to this evil practice, often have a horrible anxiety to communicate the vile knowledge which they possess to their companions, and never let an opportunity slip for instructing some one in the same filthy practices of which they are guilty.

We have met, however, a good many cases in which the victims of the habit declared most firmly that they had never received any instruction of this sort. How the habit was begun, they could hardly tell, but thought it to be the result of accidental discovery. Frequently, local irritation of some sort will produce an abnormal excitement of the parts, which leads to the disclosure of the fatal secret. A constipated condition of the bowels, the irritation of thread-worms in the rectum, and particularly irritation arising from inattention to local cleanliness, may give rise to the habit by provoking rubbing or scratching of the parts. The condition known as *phimosis*, elsewhere described, and abnormal length of the prepuce, either of which may cause retention of the normal secretions, and provoke an abnormal amount of secretion, are undoubtedly frequent predisposing causes of this practice.

Among the most potent of predisposing causes of

the practice must be mentioned bad diet. Excessive use of flesh food and the use of condiments have a powerful influence in producing an abnormal irritability of of the nervous system, and the special local excitement and irritability which favors the early development of sexual feelings, and stimulates them in the most marked degree when once aroused. The boy whose blood is made hot and feverish with stimulating food, whose nerves are irritated and excited by mustard, pepper-sauce, and other exciting condiments, is poorly prepared to resist the temptations to sexual indulgence which are certain to come to him when he mingles with other boys on the street, at school, or wherever he may come in contact with them. A man rushing through a burning building, among blazing fagots, with sparks flying in every direction, with tongues of flame darting at him from every side, would be considered very reckless if he should venture to carry with him upon his arm an open bucket filled with gunpowder, or if he should smear his clothing with pitch, oil, or other inflammable material; but such a man would be in no greater danger than the lad whose blood is inflamed with heating, stimulating food when he goes out to mingle with the world, and meets on every hand the tempting allurements which are certain to assail him.

The use of tobacco must also be looked upon as a predisposing cause of sexual vice. Tobacco stimulates and inflames the nerves, and produces a premature development of the sexual nature. Tobacco-using boys invariably have a senile appearance. They are old for their years. Not only this, but the habit of tobacco-using leads to association with boys who are addicted to

sins of various sorts, and who readily communicate their corrupt practices to their associates.

The whole life of the average city boy, brought up in the usual way, tends to develop abnormally the worst side of his nature. Almost as soon as he is born, the depraving process begins. His nurse envelops the lower portion of the trunk in many folds of diapers, which produce abnormal heat of the parts, and consequently abnormal development. Through the inattention of careless nurses, these diapers are not always changed as soon as they become soiled, and the retained secretions irritate and still further excite these parts. Sometimes, also, the evil is aggravated by covering the many folds by oil or rubber cloth, or some other impervious material. Continued for several months, sometimes two years or more, this practice must necessarily result in producing local irritations and excitements which tend very strongly in a vicious direction.

Obscene Literature.—With older boys, the reading of vile books and the circulation of obscene pictures has been a most potent cause of the propagation of vile practices of every sort. By means of foul stories and vile pictures, the imagination becomes corrupt, the love of, and respect for, purity is destroyed, the barriers against vice are broken down, and the boy becomes an easy prey to corruption of every sort. A few years ago, this evil became so extensively prevalent, and the business of publishing and circulating vile pictures and literature was carried on so openly, it became evident that something must be done to suppress it. An Eastern philanthropic gentleman formed an association for the purpose of accomplishing this object, and secured the pas-

sage of laws which enabled them to suppress the circulation of obscene books, pictures, and kindred articles through the mails. Mr. Anthony Comstock was made the executive agent of the Society, and through his labors, a great reform has been accomplished. The vile traffic has been suppressed to a very great degree, and it is to be hoped that a very active agent in propagating the vice has been permanently crippled.

In the sixth annual report of the Society for the Suppression of Vice, special attention is given to the evils resulting from the circulation of what are termed "Boy's Papers." We cannot do better than quote the following paragraphs, which thoroughly expose the evil influence of these publications, which, by destroying respect for morality and religion, encourage grossness and vulgarity, and render boys susceptible to evils of all kinds, and to none more than to the evils which lead to the vices we have been considering:—

"These papers are sold everywhere, and at a price that brings them within the reach of any child. They are stories of criminal life. The leading characters are youthful criminals who revel in the haunts of iniquity. Many of these stories are written with a vein of licentiousness throughout, debasing the mind of youth as totally as the baser sort of books and pictures. Read before the intellect is quickened, or the judgment matured sufficient to show the harm of dwelling on these things, they educate our youth in all the odious features of crime. These publications are the offspring of some of the weekly journals, that seem to run a muck-rake through the haunts of sin, and from the police court and slums of society gather weekly the sickening details

that never should be put before the eyes of adults, much less children. What is the result? The knife, the dagger, and the bludgeon, used in the sinks of iniquity and by hardened criminals, are also found in the school-room, the house, and the play-ground of tender youth. Our court-rooms are thronged with infant criminals—with baby felons.

"The following are a few facts that have been brought to the attention of the Society:—

"Our agent arrested a young man nineteen years of age, for advertising and sending through the mails, under about a dozen aliases, the most obscene matter. While searching for this vile trash in his sleeping-room at his father's house, the agent found a mass of these 'Boy's Papers' piled up in one corner. No sooner had the prisoner been discovered, than he started back, exclaiming with great force, 'There, there is the cause of my ruin—that has cursed me and brought me to this!'

"A young lad had been for months employed by a gentleman in Brooklyn, who had reposed all confidence in him, and showed him every kindness. After awhile he began to miss sums of money varying from ten cents to fifteen dollars. When questioned, he assumed the rôle of innocence, as pictured in the story when the thief is caught and accused of his crime. Then he threatened, then defied, then wept,—injured innocence,—and at last confessed (unlike the story)! When asked what papers he had been reading, he named two, and said he never thought of doing wrong till he read those stories.

"A lad about sixteen years of age in Buffalo, from reading these stories, as he afterward confessed, conceived the idea of robbing his employer's safe. In accordance

with the description of the story, he makes an impression of the safe key, takes the same to a locksmith, orders it made. The locksmith, knowing the lad, informs his employer. He then makes the key, leaving it imperfect. The lad takes it, tries it, and coolly brings it back to be altered. He tries again, and is arrested. Then he defiantly informs them that it is lucky they caught him as they did, or he would have had his fortune and been off.

"Two boys were recently arrested in this city trying to steal a ride west on the railroad. One had robbed his employer of some fifteen dollars. They had armed themselves, one with an old rusty revolver, and another with a dirk, or knife, and were starting west to seek their fortunes.

"A boy ten years of age was arrested and convicted for burglary. He was sent to a reformatory institution, and was pardoned out by Gov. Robinson on account of his age. He had been out but a few days when he and two other boys about his own age were arrested in the act of another burglary.

"Repeated instances have occurred within the last few years where boys have become brigands, and have banded themselves together with an oath of secrecy, to plunder and pillage, having a rendezvous in some cave, or deserted house, or some underground saloon.

"The principal of a large boys' school in this State noticed a manifest disorder in his school, and upon a thorough investigation, he discovered that the boys had these story papers; and the coarse joke and the slang expression, the low trick and the spirit of deceit and disobedience characterizing the story, were acted out in

every-day life. He called the best of the boys together, asking them what they thought of these papers. They were unanimous in saying, 'They are not fit for anybody to read, and are full of slang and coarse language.'"

In almost every news office, one sees displayed in a conspicuous position such publications as the *Police Gazette*, *Police News*, etc., publications with accounts of the vilest and most brutal crimes written in a manner the best calculated to encourage vice and vulgarity, and to corrupt the taste and morals of the young.

Signs of the Vice.—It is of the utmost importance that parents should be thoroughly conversant with the evidences by means of which the addiction to this unwholesome vice may be discovered. It should be remarked at the outset that only detection in the act can be considered as absolutely positive proof, and that no single symptom of the practice should be considered as conclusive evidence; but when a large number of the signs enumerated are present in a given case, the evidence may be considered sufficiently conclusive to warrant the employment of radical measures to reform the child. The following are among the leading signs of self-abuse:—

1. Change in character. If a boy who has been bright, cheerful, obedient, frank, and energetic, becomes without any apparent cause, fretful, irritable, sullen, stupid, and reticent, the evidence is very strong that he has become addicted to this evil practice.

2. Sudden decline in health without any acute illness or other apparent cause. It should be remembered, however, that intestinal worms, disorders of digestion, loss of sleep, overstudy and overwork may produce such

an impairment of health as to give rise to loss of flesh, general weakness, paleness of the face, black circles about the eyes, and other symptoms of exhaustion, although these causes of decline are far less frequent than the one first referred to. Sometimes the symptoms of decline are so great that the child or youth is supposed to be suffering from consumption. In such a case, a physical examination of the lungs will show no disease, but a thorough investigation will disclose the fact that the individual is a masturbator. It ought to be mentioned, however, that the practice may actually give rise to consumption, so that the disease may really exist when the habit is present, as the result of its long continuance.

3. Precocious development is another suspicious symptom. A child that has a senile look needs looking after.

4. Deficiency of development is likewise a result of the same cause. When practiced extensively, it stunts the growth in a most remarkable degree. The chest, instead of expanding, remains flat and narrow. The limbs are lank and feeble. The voice does not acquire its natural depth and fullness. Even the development of the beard at proper age is deficient. Both mind and body suffer from the devitalizing influence of the vice.

5. Unnatural languor, lassitude, and dullness, especially in the morning, should attract attention. A healthy child is naturally active and full of life and animal spirits. The traits named, especially if accompanied by vacancy of expression, may well give rise to suspicion.

6. Love of being alone is another very suspicious

sign which lays the child open to grave suspicion of being addicted to this vice. A child that habitually secretes itself from observation should be carefully watched.

7. Unnatural timidity in a child that previously had natural self-possession and confidence. There are other causes of timidity, however, and it would certainly be very wrong to accuse every bashful child of being addicted to this practice.

8. An appearance of unnatural boldness is a not infrequent symptom. Some young men, knowing that inability to look a person in the eye is regarded as a suspicious symptom of the habit, assume an appearance of boldness which is quite as unnatural as the symptom which he undertakes to hide. We have sometimes been told by persons addicted to this habit that they frequently found themselves staring at people in a most disagreeable way, but seemed to be powerless to help themselves.

9. A capricious appetite in children, while sometimes the result of dyspepsia or of intestinal worms, is very frequently the result of this practice. Tobacco-using should also be mentioned as a suspicious sign. Although it is not directly the result of the practice, it is pretty certain to be accompanied by it. Depraved habits, such as the eating of clay, chalk, slate-pencils, etc., are frequently observed in these cases.

10. Roundness of shoulders, or a stooping posture in sitting, sometimes result from these causes.

11. An unnaturally stiff, wriggling gait is sometimes due to the same cause.

12. Extreme nervousness, twitching of the muscles,

and lack of self-control, are symptoms seen in children addicted to this practice.

13. Little boys who show a decided preference for the society of little girls, need careful watching.

14. The boy who complains of pain in the back, weakness of the legs, and headache, if he has previously been a strong and healthy child, is probably addicted to bad habits.

15. Unnatural size and fullness of the superficial veins of the body, particularly of the hands, feet, and legs, are symptoms worthy of attention.

16. Wetting the bed is frequently the result of an unnatural irritability of the parts, produced by self-abuse.

17. Palpitation of the heart and irregular beating of the heart are frequently the result of this cause.

18. In older boys, pimples upon the face, especially when appearing upon the forehead as well as upon other parts of the face, are strong evidences of irritation of the sexual organs, produced by self-abuse.

19. Epileptic fits, occurring in young children who have previously been healthy, should lead to a careful investigation of the child's habits.

20. Constant coldness and moisture of the palms in young persons who are not suffering from any serious constitutional malady, frequently arise from the exhaustion produced by masturbation.

21. In boys who begin the practice some years before puberty, there is generally an abnormal development of the parts. If the practice is continued some time after puberty, the organs become relaxed and diminished in size.

22. Stains upon the under-clothing, night clothing, or bedding should lead to an investigation.

Parents should carefully observe the habits of their children, and on the discovery of any of the above-named symptoms, should make a thorough-going investigation of the matter. Parents are very likely to be easily led to believe that *their* children, at least, are innocent. The fact is, children are very much alike, and a somewhat extensive observation has convinced us that intellectual children—those who have had good moral training, and would seem to be less likely to acquire this evil practice—are even more likely to become addicted to it than those of a lower grade of intellect, who have more robust bodies, and hence a healthier condition of the nervous system. The first class, in consequence of a more highly sensitive organism, are more excitable and more easily fascinated by the destroying vice.

Effects of Self-Abuse.—There is no doubt but that the effects of this vice have been sometimes overdrawn; but while this has been the case once, the contrary has occurred many times. Numerous medical writers, observing the disposition of quacks to picture in a graphic and highly colored manner the effects of the evil practice, in their efforts to counteract the designs of mercenary charlatans, have frequently, in the opinion of the writer, committed the gross error of treating the matter as one of trivial importance, denying that results of the very gravest character may follow the practice if it is long continued. It is undoubtedly true that some persons have been able to continue the practice for many years, apparently without very grave results; but while this has sometimes been the case, it has many times occurred that persons who had practiced the habit for a

much less period of time, were afflicted by results most deplorable in character. The same may be said of many other evil practices. Some men are able to practice the habit with apparent impunity for many years; while others are rapidly destroyed by it. This being the case, and as it cannot be determined beforehand whether the results will be great or small, speedy or remote, it is evident that the worst results which are observed in any case, may make their appearance in any other case, and hence may be fairly presented as a picture of the possible results of the practice, and employed as an influence to prevent boys and young men from engaging in it, or to lead them to discontinue it, when the practice has already been acquired.

This evil practice, as already intimated, exercises its baneful influence upon both body and mind. The human being who gives himself up to this sort of sinful indulgence, and abandons himself to the gratification of beastly lusts by this means, is likely to become, *sooner or later*, a complete wreck physically, mentally, and morally. Let us observe :—

The Physical Effects of Self-Abuse.—As elsewhere remarked, the nervous excitement attending exercise of the sexual organs is the most exciting of any to which the body is subject. Under normal conditions, no excitement of this kind occurs until the body is fully matured, and the system has acquired its highest degree of strength and vigor. In childhood, the vital powers are wholly occupied with developing and building up the body. Any drain of this sort is consequently peculiarly harmful at this period of life. The natural processes of growth, though at first abnormally hastened in certain

directions, are ultimately checked. The body never attains full development when this habit is begun at an early age, and indulged after sexual development. All the vital powers are weakened.

Undoubtedly the indulgence of this vile practice affords an ample explanation for the great number of puny, scrawny, weak-backed, lank-limbed, hollow-eyed, pale, sallow-faced boys who may always be seen upon the streets of any city. But a small proportion of the young men of the present day possess one-half the vitality and stamina which properly belong to their age of life. Their vitality has been wasted and sapped by this monster of vice which has become so well-nigh universal among the youth of civilized lands.

Weakness of the back, feebleness of the muscles, loss of appetite, slow digestion or dyspepsia, nervousness, impairment of vision, loss of energy,—these are but a few of the physical consequences of this horrible practice.

Long and frequent indulgence of this disgusting habit often brings on a general decline. The patient loses flesh, grows pale and weak, begins to cough, and almost before he is aware that danger is threatened, finds himself a victim of that hopeless malady, consumption. We might mention a number of sad instances in which we have seen young men whose physical inheritance was good, go down to an early consumptive's grave, as the result of these hidden but potent causes. Fortunately, if the disease is discovered early enough, and an entire reform is made, the chances for the recovery of the patient are favorable; but, unfortunately, the discovery is not usually made until too late; or when

made, the patient's will and resolution have been weakened to such an extent that the habit still continues, at least at intervals, although frequent efforts may be made to escape from the thralldom of the horrible vice. Sometimes the patient reforms only to begin the practice again as soon as the symptoms of returning health remove the prospect of a speedy death.

Epilepsy.—This horrible disease, when occurring in boys or young men who have previously been healthy, is very frequently the result of this pernicious practice. Of all forms of nervous disease, none are more appalling in their aspect, and few more dreadful in ultimate results, than this. The patient is liable to be seized any moment with a horrible convulsion, by which he will be thrown to the ground, while every muscle jerks and twitches as though under the influence of a powerful electrical current, while the face is distorted by the most frightful grimaces. Strange guttural sounds are produced in the throat, while froth and blood issue from the mouth. One of these dreadful fits may seize upon an individual while crossing a bridge or while standing upon some elevated place, from which he may be thrown down, and thus killed or maimed for life. A poor fellow who was under the author's care a few years ago, was thus thrown from a window in an upper story upon a stone pavement below, and sustained injuries which crippled him for life. Every limb was broken, and the body was horribly bruised in every part.

The practice of self-abuse is particularly prone to produce epilepsy, as venereal excitement itself partakes very much of the character of an epileptic convulsion, the state of the nervous system at the moment of great-

est excitement being almost identical with that during an epileptic fit, only in less degree. It is not strange, then, that such a powerful excitement, frequently repeated, and particularly in immature individuals, should ultimately result in the production of this grave and sometimes incurable disorder.

As to the curability of epilepsy from this cause, we are glad to be able to say that when due to excesses, if the cause is removed, the disease is, in the majority of instances, readily curable, though of course it can hardly be expected that an individual can be restored to that absolute perfection of health which might have existed if the injury to brain and nerves had never been inflicted.

Disease of the Heart.—A number of cases of disease of the heart have come under the author's care, which were attributable to these causes. The patients were young men suffering with what had been pronounced by some physicians, organic disease of the heart; but a careful physical examination failed to show the characteristic evidences of this disorder, and a search into the habits of these individuals revealed in each case the fact that this vice had been practiced, and on the discontinuance of the habit, together with the application of the proper measures of treatment, a good recovery was effected.

Sexual Debility.—The victim of this practice pays the penalty for his excesses in ultimate loss of the power to continue his indulgence. By an immutable law of nature, we are ultimately deprived of any faculty which is grossly abused. So with the sexual function. Excesses in childhood or youth will certainly result in debility

and ultimate impotency, or total loss of sexual power, in advanced age. A long train of sexual disorders and diseases arises from these indulgences, which the limits of our space here do not allow us to present in detail, but which we shall consider elsewhere in this work. Premature or excessive indulgence of any faculty results in its early impairment and extinction, and in no instance is this law of nature more rigorously enforced than in the case of the sexual function.

Sexual Neurasthenia.—Neurasthenia, or general nervous debility, is one of the most prevalent of all nervous disorders. A peculiar form of the disease, which may be properly termed *sexual* neurasthenia, is one of the most conspicuous features of the results of masturbation. One of the curious features of this malady is the great number of symptoms to which it may give rise. The expression of the disease may be through almost any organ or system of organs in the body. In one case, the head symptoms seem to be most prominent. The patient consults a physician, who tells him he is suffering from hyperæmia or anæmia of the brain, which means too much or too little blood in the brain. Another one attributes all of his symptoms to malaria. Still another talks about softening of the brain. Another suggests rheumatism; another, disease of the bladder; another, paralysis; another, disease of the spine. Almost every physician will make a different diagnosis, and pursue a different line of treatment, often overlooking the real seat of the disease, and ascertaining nothing respecting its cause. Very frequently, a physician will tell a patient there is nothing at all the matter with him, being led to make this declaration by the fact that the

symptoms are so varied and so mixed up that he cannot make a definite diagnosis.

The suffering which a person may undergo when afflicted with this malady, is certainly such as no person in his right mind would bring upon himself; and these cases should be a warning to those who have not yet accomplished their utter ruin by addiction to this vice.

Mental and Moral Effects.—The most conspicuous mental effects observed in the victims of this vice are confusion of thought and dullness of mind. The patient, if a student, complains that he cannot learn his lessons as readily as formerly. He cannot concentrate his mind so as to do efficient mental work. He will spend many hours in the effort to perform a task which formerly could be dispatched in a very short time. There seems to be a cloud upon the intellect which is sometimes lifted for a brief interval, but again settles down upon the poor victim's brain, and shuts out from him that mental clearness and acumen which he had formerly possessed.

Another very constant mental symptom is loss of memory, especially of names and of recent events. The patient's mind has become so debilitated, his nerve tone so lowered, that the impressions made upon his brain are evanescent and very easily effaced, so that current events which come to his notice pass out of mind almost as quickly as observed.

After a time, the judgment becomes seriously impaired, and the individual is unfitted to bear the burdens and responsibilities of life. Fickleness of mind renders it impossible to maintain fixed ideas or opinions any great length of time. Even the sense of propriety is lost. The individual becomes erratic, often irritable,

a burden to himself, and an annoyance to his friends, who, if not utterly estranged from him by his perversities and strangeness of demeanor, apologetically regard him as a "crank." There are thousands of these poor creatures who stumble through life in the most unhappy manner possible, with intellect so impaired, with judgment so perverted, that they really live upon the very border-line which separates the sane from the insane, and which entitles them to the significant name coined for the purpose of designating them, by an eminent Eastern specialist, who terms this class of persons "border-liners."

Insanity.—The victims of this vice crowd the insane asylums in every civilized land, and are the most hopeless, unhappy, degraded victims of this terrible malady. One of the curious features of these classes is that the patient, especially at the beginning of the disease, is particularly exercised upon religious subjects. In a number of cases which have come under the professional care of the author, this feature has been very marked. Perhaps we cannot do better in dealing with this part of our subject than to quote the following excellent description of insanity, when produced by these causes, by Dr. Richy, an English author :—

General Symptoms.—"On entering an asylum for the insane, especially if it be one receiving patients from the middle as well as from the lower class of society, there is one group of inmates which may arrest the attention of the visitor from the contrast presented to the excited persons around him on the one hand, and to those who are convalescent on the other. Engaged in no social diversion, the patients of this group live

alone in the midst of many. In their exercise, they choose the quietest and most unfrequented parts of the airing-grounds. They join in no social conversations, nor enter with others into any amusement. They walk alone or sit alone. If engaged in reading, they talk not to others of what they may read; their desire apparently is, in the midst of numbers, to be in solitude. They seek no social joys, nor is the wish for fellowship evinced.

"The pale complexion, the emaciated form, the slouching gait, the clammy palm, the glassy or leaden eye, and the averted gaze, indicate the lunatic victim to this vice.

"Apathy, loss of memory, abeyance of concentrative power and manifestation of mind generally, combined with loss of self-reliance, and indisposition for or repulsiveness to action, irritability of temper, and incoherence of language, are the most characteristic mental phenomena of chronic dementia resulting from masturbation in young men.

"As in diseases of an exhaustive nature, we find that the cutaneous secretion is poured forth abundantly, so in the cases occupying our attention, the perspiration breaks forth on the slightest exertion. This relaxed condition of the perspiratory system is especially marked in the palms, and the exception is to find these dry in the masturbator; for, generally, a damp or cold, clammy perspiration is constantly present, and makes it particularly disagreeable to take the hand of one of these persons. The sub-integumentary layer is but sparingly supplied with fat, which is remarkable, considering the little exercise these patients, if left to their own guidance, would take.

"To conclude this description, it is only necessary to add that the gait is slovenly or slouching, that the gaze is down-cast or averted, and when addressed, the masturbator does not look the speaker openly in the face whilst he replies, but looks to the ground or beyond the questioner."

The ultimate result of disease from this cause is imbecility or idiocy. The mental powers gradually weaken, if the habit is continued, until the brain structure becomes so seriously impaired that the individual is reduced to the level of the brute. Almost the last ray of intelligence is extinguished, and indeed in some respects the victim of this mind-destroying vice in the last stages of his existence may become reduced even below the level of the brute creation. The patient becomes a mere animal, who eats, sleeps, and breathes, but is utterly deprived of all human characteristics, with the exception of an outward semblance. He is conscious of neither joy nor grief, pleasure nor pain. He takes his food and drink mechanically. He sits staring vacantly into space, with an open, drooling mouth, and a senseless, idiotic smile upon his face. If not closely cared for by an attendant, he defiles himself with the evacuations of the bowels and bladder, and becomes filthy and unwholesome beyond description. Most horrible indeed is the spectacle of a human being in ruins, brought down to this most unspeakable degradation by his own vile practices.

A Victim's Picture of Himself.—Jean Jacques Rosseau, one of the most distinguished of French writers, but a victim of this most degrading of vices, wrote a confession to his son, and the following account of its consequences:—

"One might say that my heart and my mind do not belong to the same person. My feelings, quicker than lightning, fill my soul; but instead of illuminating, they burn and dazzle me. I feel everything; I see nothing. I am excited, but stupid; I cannot think except in cold blood. The wonderful thing is that I have sound enough tact, penetration, even *finesse*, if people will wait for me. I make excellent impromptus at leisure; but at the moment, I have nothing ready to say or do. I should converse brilliantly by post, as they say the Spaniards play at chess. When I read of a Duke of Savoy who turned back after starting on his journey to say, 'In your teeth, you Paris shopkeeper!' I said, 'That is like me!'

"I find the same sluggishness of thinking, joined with the same vividness of feeling, not only in conversation, but even while I work. My ideas arrange themselves in my brain with incredible difficulty; they circulate there dully, fermenting so as to excite me, heat me, give me palpitations; while in the midst of all this emotion, I see nothing clearly; I could not write a single word—I must wait. Insensibly this great turmoil calms down, the chaos disentangles itself, each idea puts itself in its own place, but slowly and after long, confused agitation. Have you ever seen the opera in Italy? While the scenes are being changed, there is a disagreeable and prolonged disorder in these great theatres; all the decorations are mixed up; you see pulling and hauling everywhere, which is positively annoying; everything seems on the point of tumbling down; however, little by little, all gets arranged; nothing is wanting, and the spectator is astonished at seeing an exquisite

scene follow the long tumult. Almost the same proceeding goes on in my brain when I want to write. Could I have waited, and rendered in all their beauty the images thus painted there, few authors would have surpassed me.

"Hence arises the extreme difficulty I find in writing. My MSS., scratched, blotted, mixed up, undecipherable, attest the labor they have cost me. There is not one of them I have not had to transcribe four or five times before sending it to press. I have never been able to do anything pen in hand, with a table and my paper before me. It is out walking among the rocks and woods; at night in bed, while lying awake, that I write in my brain; it may be imagined with what slowness, especially for a man absolutely without verbal memory, and who has never in all his life been able to learn six lines by heart. There are some of my sentences that I have turned and re-turned during five or six nights in my bed before they were in a state to be put on paper. Hence I succeed better in works that require labor, than in those which require a certain degree of readiness, like letters,—a kind of composition of which I have never been able to catch the proper tone, and the effort at which is misery to me. I never write a letter on the smallest subject that does not cost me hours of fatigue, or if I want to write at once what occurs to me, I can neither begin nor end; my letter is a long or confused verbiage, hardly to be understood when read.

"But not only is it a labor to me to express, but also to receive ideas. I have studied men, and I think I am a tolerably good observer; yet I can see nothing

of what I do see. I can hardly say that I see anything except what I recall. I have no power of mind but in my recollection. Of all that is said, of all that is done, of all that passes in my presence, I feel nothing, I appreciate nothing. The external sign is all that strikes me. But after awhile, it all comes back to me. I remember the place, the time, the tone, the gesture, the circumstance,—nothing escapes me. Then, from what has been done or said, I discover what was thought, and I am rarely deceived.

"If I am so little master of my mind while alone, it may be conceived where I must be in conversation, where to speak *a propos*, one must think at the same time and at a moment's notice of a thousand things. The mere idea of so many proprieties, of which I am sure to forget at least one, is enough to intimidate me. I do not even understand how a person can dare to speak in company; for at each word one ought to pass in review every one that is present, to be acquainted with all their characters and know their histories, in order to be sure to say nothing that may offend any. Certainly, those who live in the world have a great advantage here; knowing better what *not* to say, they are surer of what they do say; yet even from them slips many an unfortunate speech. Imagine the condition of a man who falls into it all from the clouds; he can hardly talk with impunity for a minute. In *tête a tête* there is another disagreeable, which I find worse. I mean the necessity of talking constantly; if spoken to, you must answer, and if nothing is said, you must take up the conversation. This unendurable constraint alone would have disgusted me with society. I find no bur-

den more intolerable than the obligation to speak at once and constantly. I do not know if this arises from my mortal aversion to all subjection; but it is quite enough to be obliged to speak to make me infallibly say something foolish.

"What is more fatal is that, instead of knowing how to hold my tongue when I have nothing to say, it is just then that, to pay my debt as quickly as possible, I have a mania for talking. I try in a hurry to stammer, promptly, words without ideas, only too happy if they mean nothing at all. In trying to conquer or hide my inaptitude, I seldom fail to display it.

"I believe this is the real explanation why, though I am not a fool, I have often passed for one, even with persons capable of judging; all the more unhappy because my physiognomy and my eyes promise something better, and my failure makes my stupidity all the more shocking to others. This detail, which a particular instance has suggested, will not be useless to any one who follows it. It contains the key of many extraordinary performances of mine, which have been attributed to an untamed humor which I do not possess. I should relish society as well as any one, if I were not sure to exhibit myself, I do not say only to disadvantage, but as something quite different from what I am. The system I have adopted of retirement and writing, precisely suits me. No one would ever have known, from my presence, what I was worth; no one would ever have suspected it."

No more accurate description of the mental condition of these sufferers could be drawn than the above. We have seen scores of these cases who would indorse the description as being in many particulars applicable

to themselves. The reader will readily see in the manner in which this learned victim describes his case, in the horrible frankness with which he analyzes his character, the strongest possible evidence of the influence of this terrible vice in destroying the finer sensibilities, that delicate sense of propriety, that high regard for purity, which undepraved human beings possess.

The Remedy.—Prevention is greatly to be preferred to cure. Prevention saves suffering, shame, mortification, and despair. Cure too often means simply a mitigation of ills, the major part of which must be borne. How many times has a poor victim of this vice said to us, with tears streaming from his eyes, and dark despair written upon every lineament of his face, "Oh, why was I not warned of the terrible suffering I must endure? Why was I not told of the horrible wickedness of this filthy vice?" No tongue can describe the mental anguish, the despair, the shame of one of these victims, who, after years of transgression, is suddenly awakened to a realization of his folly, when he discovers the ruin he has wrought. Never to have been born would be far better than this living death.

If the habit has been formed, how may the victim be rescued from its thralldom? The great obstacle in the way of the recovery of these unhappy creatures is the fact that the individual's will is weakened; his conscience is blunted; his passions have grown with gratification until they have asserted complete mastery over mind and body. In addition to this, physical conditions have been established which, at a superficial glance, seem to justify the habit in a small degree, so clamorous are the demands for gratification. This, however, is but the

result of the long continuance of the practice, and no more justifies it than the physical craving of the drunkard for his dram, and the immediate relief which follows the gratification of his appetite is a justification of his intemperance.

The first thing to be done is to arouse, if possible, the patient's moral sensibilities. To accomplish this, it is proper to employ every sentiment possible. Moral obligation, love of purity, self-respect, pride, even fear, may all be appealed to for the purpose of arousing the person to such an effort as will result in his rescue. Too often the result is that the individual, though he may readily acquiesce in all that is said to him respecting the error of his ways, and may earnestly long to escape from the misery of his vice, has lost his power to resist temptation through the weakened state of the will and the constant yielding to desire. Temptation will come, and the poor fellow who an hour before solemnly pledged himself to abandon his vicious practices, and perhaps on his bended knees confessed his sins and prayed for Divine assistance, falls an easy prey to the tempter. No sooner is the act committed, than remorse, shame, despair, seize upon him, and plunge him into the very depths of wretchedness. Thus his life becomes a constant oscillation between resolve and failure, courage and despair.

Happy indeed is the repenting victim of this debasing vice who has the good fortune to possess some true and faithful friend who will aid him in fortifying his resolutions, who will rally his courage when repeated failure plunges him into hopeless despair.

Let him who will reform, resolve to succeed or die,

and he may be sure that success will materially diminish the prospects of dissolution. Let him determine that no temptation, no subterfuge, no sophistry, shall again seduce him from the path of purity.

The following suggestions we have often given to those who are engaged in this struggle for liberty, and when faithfully followed, the result has been success:—

Mental Purity.—The mind rules the body. Every involuntary function is the result of mind action. The brain furnishes the impulse which sets in motion and maintains in action all the vital functions. The ancient proverb, "As a man thinketh in his heart, so is he," is most emphatically verified by this class of transgressors; hence the importance of maintaining purity of mind. The thoughts must be thoroughly cleansed from every hint or suggestion of uncleanness. The person who is impure in mind, will soon be impure in actions. The mind which is filled with filthy imaginations will be utterly unable to withstand the tornado of desires which his own mental debauchery will bring upon him. Let him resist the first suggestion of lascivious thought. Let him shun mental uncleanness as he would the leprosy or a venomous serpent. Let him cultivate purity of mind, chastity of thought, and abhorrence of vileness and impurity. Thus will his resolution be strengthened, and his power of resistance fortified. Thus, too, will he succeed in repressing those physical incitements to sin which are the result of long yielding to the tempter.

Mental Occupation.—The nursery rhyme which certainly involves a great truth, "Satan finds some mischief still for idle hands to do," might well be parodied, Satan finds some vileness still, the empty mind to fill.

The unoccupied mind very readily becomes a prey to unclean thoughts, especially when the imagination has for a time been allowed to run riot in sensuality. Such a mind, when left unoccupied, runs into uncleanness as readily as a duck takes to water, or a frog to a slimy pool. Complete and constant mental occupation is the only safeguard. It is far easier to keep out unclean thoughts than to get them out when they have once occupied the mind. Keep the mind full of pure, wholesome, elevating thoughts, and there is no room for anything of a low, vulgar, or filthy nature.

After long indulgence, the mind comes to dwell upon vile things involuntarily. The brain is so modified by habit that it runs readily into the channel of concupiscence. By constant, persistent effort, this basis for unclean thought may be eradicated, and the mind restored, in a measure at least, to its original purity. By constant cultivation of pure thoughts, the mind learns to run naturally and easily in the channel of purity.

But this result cannot be accomplished in a day, nor in a month. Sometimes years, even, are required to efface the scars and blemishes made upon the mind by years of indulgence in impurity.

A Valuable Hint.—Young man, are you thoroughly in earnest about this matter? Do you thoroughly detest the sight and thought of uncleanness? Are you thoroughly anxious to wash out from your brain the dirt and filth which years of wrong doing have deposited there? In the midst of your struggle, do evil thoughts come into your brain, and take possession of you against your will? Do you earnestly long to free yourself from the shackles of mental sensuality? Here is a sug-

gestion for you: Write down upon a card half a dozen words which represent the purest and noblest thoughts and experiences of your whole life, such words as will call up some engrossing theme which will be certain to attract and hold the attention of the mind. Now, when an evil thought comes, either in mind or in act, bring out your card. Seize upon a word, and resolutely set your mind to work upon it. Do not give the tempter the slightest foot-hold. Grapple with him at the very threshold of your mind, and keep the mind occupied until the deceiver has passed by.

Good Associations.—Among the greatest of helps to mental purity and chaste occupation of the mind are good and profitable associations. One who is trying to win himself from evil thoughts and evil ways should sedulously avoid those whose conduct or conversation incline in that direction. Let him seek the association of the good, the pure, the noble, those whose example it will be safe for him to emulate. Let him on no account allow himself, even on a single occasion, to associate with the vile, the obscene, the licentious, those whose influence will be calculated to lead him in a downward direction.

Diet.—The influence of diet in stimulating the passions, we have already mentioned. To a person struggling to repress evil desires, simplicity in diet and the avoidance of exciting and stimulating foods is of the greatest consequence. Such condiments as mustard, pepper, pepper-sauce, vinegar, and Worcestershire sauce should be wholly discarded. Flesh food should be taken very sparingly. The diet should consist chiefly of fruits, grains, vegetables, and milk. Overeating should

be carefully avoided, as it produces a plethoric condition of the portal circulation, causing congestion of the genitals, and fills the blood with crude and undigested materials which excite and irritate the passions through irritating the nerve centers. Starvation is one of the very best means of combating lust, and the man who finds himself well-nigh overwhelmed by temptation, whose passions have so long had the ascendency that he has become an abject slave, without will-power or resistance, should consider whether he cannot better, for a brief period, reduce his bill of fare to the very lowest point above starvation, and conquer, rather than suffer defeat in his conflict with the beast that rules him.

Ices, confectionery, and pastries of all kinds should be sedulously avoided. If alcoholic drinks of any sort or tobacco in any form have been indulged, they must be wholly abandoned. We say wholly, because we have sometimes known persons to imagine that partial abstinence would answer equally well. But this is not the case. When stimulants or narcotics of any sort have been indulged, the continuance of their use, even in small quantities, continues the mischief by keeping alive the old flame, and preventing that utter extinction of the depraved appetite which only occurs when the last atom of the poison is eliminated from the body, and the tissues have returned to their normal condition. Even tea and coffee, at least if taken strong or in any considerable quantity, exercise an undoubted influence in the same direction as other narcotics and stimulants, though in a less degree. Better discard them altogether, and substitute hot water, or better still, hot milk.

Exercise.—Proper exercise is all-important for one

engaged in the struggle to suppress the passions. Muscular work draws the blood away from the excited nerve centers, calms the passions, and inclines the individual to repose and rest rather than to indulgence in vice. By exercise, we do not mean a few minutes' swinging of Indian clubs or playing with dumb-bells, or five minutes' exercise on a lifting machine, or a leisurely stroll along Broadway, or an occasional excursion into the country, or now and then a day's hunting or fishing; we mean actual work, hard muscular exercise taken daily to the amount of real fatigue. For information respecting how exercise should be taken and the proper amount to be taken in a single day, the reader is referred to the chapter in this work devoted to that subject.

Sleep.—While too much sleep undoubtedly conduces to habits of luxury and stimulation of the passions, a proper amount of sleep has the opposite effect of quieting the exhausted and irritable nerve centers, and securing that condition of health which is best conducive to strength of mind and will, as well as of body. Go early to rest, and rise early in the morning. Avoid dozing after waking up in the morning. A second nap is rarely beneficial, but is often harmful, and the condition of half sleep and half wakefulness into which a person is likely to drop after waking from sound sleep, is one in which the mind is likely to run riot in forbidden channels.

Let us say one word about day-dreaming, a practice into which unoccupied young people are very apt to fall. We consider it to be in the highest degree pernicious. These listless reveries are apt to be prurient and sensual in the extreme; and for one who is struggling against impurity of thought and life, they are

positively dangerous. The mind is in a peculiarly receptive state; the will is dormant; evil finds a ready foot-hold, and speedily develops into all degrees of filthiness. If tempted to drop into one of these stupid moods, arouse instantly your latent energies, and engage in some kind of physical or mental activity that will effectually dissipate the unprofitable inclination.

Daily Bathing.—The practice of daily bathing is in the highest degree conducive to both physical and mental purity. Immediately on rising in the morning, take a sponge or towel bath, occupying one or two minutes, and rub dry with a coarse towel. The vigorous glow of the skin which follows a cool bath taken in this way has a most happy effect upon the body and mind. Tepid water may be used at first if the person has been unaccustomed to bathing, but should be gradually lowered in temperature until quite a cool bath may be thoroughly enjoyed. Positively cold water should never be used, to obtain the very best effects, and for a person in delicate health and with little power of "reaction," cold water is often very harmful.

Care of the Bowels.—A constipated condition of the bowels produces congestion of the genitals and an unnatural excitability, which may react upon the mind in such a way as to produce a powerful incitement to vice; therefore the bowels should be kept regular by the employment of such means as may be required. The large use of fruit in diet; the employment of coarse grain preparations, such as cracked wheat, oatmeal, etc.; the use of graham instead of fine flour bread,—all these things conduce to a proper regularity of the bowels. The bowels should move every day soon after breakfast.

If movement cannot be obtained in any other way, an enema should be taken, although the use of the enema as a habit should be avoided. When a great amount of irritability exists, a cool enema will be found to have a remarkably efficient effect in quieting the abnormal excitement. Hemorrhoids, or piles, rectal irritation, and especially intestinal worms, act reflexly upon the genital organs, producing abnormal excitement, and when present, should receive such attention as will secure their removal.

Phimosis.—As previously remarked, a tight or long prepuce may produce abnormal irritability of the parts by retaining the natural secretions, or producing an abnormal amount of secretion. This cause alone has undoubtedly often led to the practice of self-abuse, and, if present, would add greatly to the difficulty of overcoming the vice. Such a condition requires a surgical operation, which should be performed by a competent surgeon.

The most scrupulous attention should be given to local cleanliness, and careful avoidance of any physical or mental cause of excitement or irritation.

Religion.—We must not fail to remind the reader that the most potent of all aids, to one who is really penitent for past sins, and is thoroughly in earnest in the effort of reform, is to be found in the helps afforded by genuine religion. Prayer offers a ready means by which the weak victim of evil habits may reinforce his wavering resolutions, and scatter from his mind the evil images which allure him to sin. The Divine aid thus obtainable may make the weakest strong, and may enable the most helpless and despairing wretch to rise

triumphant over his besetting sin. No one, however firm in purpose, and however strong in will, can well afford to neglect this never failing means of grace and strength.

To Cure the Practice in Children.—When the parents of a boy discover that he is addicted to the practice, they should bring to bear upon him the strongest moral suasion possible, and should watch him closely. If not successful by these means, they should, if necessary, administer proper punishments. If still unsuccessful, means should be taken to render the practice impossible. In many cases in which the tight or long prepuce requires an operation, this may be sufficient to interrupt the practice. In young children, especially, the practice, if interrupted for a few weeks, may be broken. The application of a blister, so as to render the parts tender and sensitive, is a method applicable to some cases. A method which is wholly successful, though productive of some pain, is the following:—

Draw the prepuce down beyond the glans, passing a silver wire through the skin on either side, and twist the ends together in such a way as to draw the two sides of the prepuce so close together that it cannot be drawn back from the glans. This, in exceptional cases in which the prepuce is unusually long, will effectually prevent erection, and consequently interrupt the habit. This method, for which we are indebted to Dr. Archibald, Superintendent of the Iowa Asylum for Feeble Minded Children, we have employed in a number of cases with entire success. The pain produced by it is not great, and is in most cases an advantage rather than an objection, as it has a decided tendency to diminish the desire to continue the practice.

SOCIAL VICE.

Illicit intercourse of the sexes is certainly entitled to the second place in the list of sexual sins which we are considering in this chapter. The evils which arise from the social vice are not only numerous, but appalling in character, whether they are considered from a physical or a moral standpoint. Among the ancient Greeks, the practice of this vice was practically ignored, and courtesans were even held in high social esteem, sometimes attaining to positions of honor in the State. Their position was really in some respects above that of honest women; and they were in no way regarded as worthy of reproach or dishonor. During the Middle Ages, gross immoralities prevailed among all classes, not excluding the celibate clergy. A large share of the convents were little better than brothels. Courtiers and kings joined hand to hand in voluptuousness, and even popes scandalized the religious world by the number of their illegitimate children.

At the present day, crimes of this character are less openly committed, perhaps, than during any previous time in the world's history; but that there is really a less degree of vice of this sort is a question which might bear considerable investigation. From what opportunities we have had for investigating this subject, which have not been few, we are inclined to think that the principles of purity and chastity are less regarded at the present day than a generation ago, although perhaps the state of things in this regard may not be so bad as has sometimes existed in ancient times in various parts of

the old world, or even in periods not far remote from the present.

While traveling in Europe a few years ago, we took some pains to make inquiries of reliable persons as to the state of public morals, and were satisfied that in many of the larger cities, at least, virtue is less highly prized, and vice is looked upon with less abhorrence, than it was a generation ago.

Causes of Decline of Purity.—If we inquire for the cause of this decline of purity in morals, we shall find it to be varied. First, and most important of all, we would suggest that the increase of vice must be due to the general lowering of moral tone among the people, and particularly among the members of the rising generation. It must be evident to every observing man or woman that conscientiousness, love of truth, righteousness, spirituality, and in short, all religious principles, have a less active influence upon the lives of the youth of the present day than upon those of their predecessors. The growing prevalence of skepticism, propagated by profane scoffers of the Ingersoll type, and encouraged by a certain class of scientists who array their notions respecting the teachings of nature against the Bible and religion, have a marked tendency to weaken the general religious faith of the people, and lessen the influence of moral precepts upon human conduct.

The familiarity with vice in its grossest forms, which arises from the freedom with which the newspapers of the day deal with crimes of this sort, with little or no attempt at delicacy of expression, and usually dwelling with unnecessary particularity upon the details of the crime, has a decided tendency in this direction. Pruri-

ent novels and other sensational literature, whose name is legion, are also justly chargeable with a large share of the retrograde which has taken place in this direction.

One of the most conspicuous examples of this lowered moral tone as relates to matters pertaining to the relations of the sexes, is to be seen in the loss of that modest reserve in their deportment toward each other which characterized the boys and girls and young men and women of a generation ago. It has become fashionable for young ladies to appear bold and "pert" in their manner toward young men, and the latter are certainly not the least behind the other sex in lack of modesty and reserve in their behavior. When it is remembered that modesty and proper reserve in manner are among the most effective safeguards of virtue, it will be readily seen that the marked declension in manners, which is so apparent in this particular, points very strongly indeed to a corresponding declension in morals.

Too Great Familiarity of the Sexes.—The excessive familiarity of the young of both sexes in social intercourse, tends in a most decided manner to break down the barriers against impurity, and to prepare the way for the most flagrant violations of purity and chastity. The unrestrained liberty which parents allow their sons and daughters who have not yet attained years of maturity and discretion, the opportunities afforded by theatres, balls, fashionable parties, etc., and the other vice-favoring conditions of modern fashionable society, operate as efficiently in the corruption of morals as though the organizers of modern society had purposely arranged for the accomplishment of that very destruction of virtue and morality which we see so evidently taking place all around us at the present day.

Evil Courting Customs.—The unlimited freedom allowed the young during real or pretended courtship is certainly not conducive to improvement in the direction of social morality. We are guilty of no exaggeration when we say that we have met scores of young persons who have gone astray from the path of virtue, and who acknowledged to us that the familiarities allowed when "keeping company," constituted the first step taken in the road which ultimately led to the commission of the grossest sins. Fathers and mothers who wish to preserve the purity of their sons and daughters, should make a vigorous protest against the growing looseness of manners and unrestrained freedom of social intercourse among the sexes, whether carried on under the guise of courtship, or without the pretense of this flimsy excuse.

There was a time in the history of the world when a young man who had committed a gross crime against virtue was considered unfit to live, and was taken without the city, and pelted to death with stones. At the present time, a young man who is known to be a rake, a debauchee, and a seducer of women and girls, is made welcome to the highest circles of society, and often receives as much or even greater attention from fashionable young women, and older women too, than those whose lives are spotless. The fact that a rake is always popular among women, even those who are not themselves guilty of overt grossness, is a reproach upon the judgment and moral sense of those women concerning whom the charge is true, but is no excuse whatever for the young man.

Nothing could be more fatal to purity of life among the young of either sex than the popular idea that the

young man may sow his "wild oats," and still be a "first-rate good fellow," and worthy of positions of trust and responsibility in society; and the fact that such a notion prevails, is further evidence of the lowered moral tone of society to which we have already referred. It will be a happy day to the cause of morality when society says to the young man who lapses from virtue, as it does to a young woman under the same circumstances, "You have forfeited your right to honor and respect. You have violated one of the plainest laws of God and man. You have become a social leper, and are likely to spread vile moral contagion more potent for evil than the virus of a rattlesnake, or the contagious virus of small-pox or cholera. Hence, unless you repent and reform, and earn a right to the confidence of the good and the pure, you must be an outcast from society, subjected to a social quarantine which will effectively prevent the contamination of your fellows."

Let young ladies demand of young men who wish to become their husbands the same unblemished purity which is required of them, and we may hope for an improvement, at least, in the manners and morals of the youth of the rising generation.

Precocious sensuality, the customs, manners, and in fact most of the conditions of life in civilized society, tend to a premature development of the sexual instincts. Little boys and girls are taught to ape their elders in showing each other attentions which are only appropriate, when proper at all, in those of older years. Little boys, in their associations with those who are their superiors in years, have their minds filled with every sort of filthiness, and are early instructed in the vile,

sensual trash which passes from one lad to another on the street. By this means, the boy's repugnance for grossness and impurity is speedily overcome, and he is soon ready to embrace the first opportunity to gratify his precocious passions and his prurient curiosity.

Parents are often greatly blamable for carelessness in regard to the sleeping arrangements of their children. Little boys and girls are often allowed to sleep together until they have reached an age far beyond that at which their purity might be endangered by so doing, and in a number of cases we have traced the beginning of a life of sin to this cause. Barriers against impurity and vice cannot be placed about the little boy at too early an age. From almost the beginning of his existence, the evil demon of lust stands ready, watchfully waiting to improve the first opportunity to claim him as a victim.

Among other causes, we might enumerate all those to which attention has already been called that predispose to the habit of self-abuse, but we need not recapitulate. Let us now consider—

The Results of Social Vice.—Only an educated and experienced physician can appreciate in any adequate degree the horrible consequences to body as well as mind and soul which follow in the wake of social immorality. Upon this vice are founded the more than twenty thousand brothels which exist in this land of Christian civilization and enlightenment. In these anterooms of hell are to be found more than one hundred thousand depraved and abandoned women, who have offered up their souls and bodies upon the shrine of concupiscence. They have abandoned home, kindred, friends,—all that is most sweet and dear in life, all that is pure and noble

and good, all that is human and tender and true, and have offered themselves upon the altar of lust, human chattels to minister to man's beastliness, to gratify unhallowed passions which "war against the soul;" which sap the life blood of all human feelings and sentiments; which, unrestrained and ungoverned, would speedily convert the whole earth into one vast Sodom and Gomorrah; which brooks no restraint, and is as merciless and insatiable as the Minotaur of ancient fable. It places the cup of nectar to its victim's lips, only for the purpose of hiding the deadly venom which its sweetness covers.

One hundred thousand poor, wretched women thus become outcasts from society, despised by their sex, looked upon as more debased than the swine that wallows in the mire, or the loathsome reptile that haunts the slimy pool, abandoning all hope of this world or the next, consigning their souls to eternal infamy, and condemning their bodies to a life of shame and misery and a death too horrible to contemplate,—all this to gratify a million beastly men, a large proportion of whom must also share the fearful end to which their consorts are hastening.

Many young men imagine that they can sow a few wild oats,—in other words, can lead for a few months or years a life of immorality,—and then reform, "turn over a new leaf," as they say, and settle down to a sober, steady, and virtuous life. Young man, do not be deceived by such sophistry. While it is possible for a few to seem to accomplish this, if you could have marshaled before you the great hosts of those who have undertaken to act upon this plan, and failed, you would be dismayed with fear at the thought of such an undertaking. A man

who has once allowed himself to become entangled in the toils of sensuality, will find escape a task by no means easy. A thousand influences deter him from the reformation which he contemplated; a thousand obstacles appear in the way, none of which have previously entered into his calculations; and if he is so fortunate as to break away from the bonds of evil associations, and shake himself free from the shackles of sensual habits long fostered, his difficulties are by no means mastered. Although he may settle down to a sober life, the old passions, the old customs, the old illicit pleasures, haunt him, and allure him like the voices of sirens wooing him to destruction. In his waking thoughts, and in the dreams of his sleep, the passions which have been long encouraged, stimulated, and gratified without stint, clamor for indulgence, and goad him almost to desperation. What would not such a man give to blot out from his memory the imperfections which have been indelibly fixed upon it, the sins in which he has been an active participant in haunts of vice and shame? What would he not give to rid himself of the filthy imagery with which his wanderings from the path of virtue have filled his brain?

Another thought for the candid consideration of you young men who imagine that you can sow a few wild oats, and be as good as anybody: To a man who has allowed the beast of passion to grow up within his heart and rule him, who has plunged headlong into the sea of sensuous indulgence, to such an one, common pleasures, the legitimate joys of life, are unspeakably tame and insipid. Fill your mouth with honey. Now taste an orange or a luscious pear. Before the honey you would have called it sweet, delicious; now you say the fruit is

tasteless, mawkish. So it is with our mental and moral tastes. The man who has spent the best years of his life in sensual pleasures, cannot appreciate the quiet, unexciting joys of legitimate love and domestic life. The field of his heart, once covered with golden grain, has been burned over by the fires of lust, which have left it blackened and seared and scarred and blistered, and as incapable of tender sensibilities and pure sentiments and emotions, as a charred stump. The harvest is past.

We do not wish by these remarks to discourage those who earnestly long to redeem themselves from a life of sensuality, from making earnest effort to reform. Doubtless those who have descended to the lowest depths may recover themselves to a great degree. Fortunately, there are many whose characters have not been wholly debased, who have not entirely abandoned themselves to vice, but have perhaps been rather the victims of adverse circumstances, than of a contempt for purity and devotion to vice; to all such we would earnestly say, Manfully struggle for victory before your shipwreck is complete. By a life of penitence and earnest devotion to the work of reforming your deformed and tainted character, you may hope, in part at least, to atone for your transgressions, and in some measure reinstate your character.

MARITAL EXCESSES.

Quite a large proportion of sexual disorders in married men, and certainly a great share of the maladies peculiar to the sex occurring in married women, may be justly chargeable to excess in sexual indulgence. The prevalent notion that the marriage ceremony opens the

door for unlimited gratification of the passions, is a grave and mischievous error, which has led to much suffering and unhappiness, and has possibly laid the foundation for a large part of the domestic infelicity which has ultimated in estrangement of husband and wife, and perhaps in divorce.

It ought to be more generally known that the excesses committed under cover of marriage are among the most potent causes of disease in civilized communities. At the very outset of married life, loose rein is often given to the passions, and the habit of excess is formed, sometimes being continued for years. Frequently, men have acknowledged to the writer, in the confessional of the examining room, that during their entire married life, covering a period of many years, they had indulged daily, and sometimes more frequently. Is it to be wondered at that these men found themselves becoming infirm and old at the age of forty or forty-five, when they should have been in the prime of life? that they should complain of mental or physical weakness, and of a general decline of the vital powers? And yet the real cause is rarely suspected. The decline in health is attributed to overwork, confinement, unfavorable climate, or some other cause equally foreign to the real one.

A very curious feature of these cases is the extreme anxiety for the complete restoration of the sexual powers so as to permit of their continued exercise. Some time ago, one of these patients presented himself for examination and treatment, who was more than sixty years of age, and yet he was chiefly anxious for recovery to enable him to return to his sexual pleasures. His attention was invited to the fact that he had reached

an age when the sexual functions should cease to be exercised, and that nature had mercifully taken away from him the power to continue his excesses so as to give him an opportunity to live a few years longer. Yet his anxiety to return to his follies did not diminish.

We are convinced, from extensive observations, that quite a proportion of the nervous break-downs in men which are attributed to overwork, cases of so-called softening of the brain, etc., are due to marital excesses. A few months of absence from home, traveling among diverting scenes, with abstinence from venereal indulgence, generally effects a rapid cure in these cases, unless the organs have been so weakened by excess that the same exhausting drain continues in the form of involuntary seminal losses, as is very likely to be the case, especially in persons of a nervous temperament and feeble constitution.

The Sexual Function not Essential for Health.—The popular notion which prevails among men, and which is encouraged by the opinion of some physicians, viz., that sexual indulgence is a physiological necessity, is certainly erroneous. Physicians are very apt to imbibe many of the medical theories current among the people, especially if they possess any degree of plausibility, and we believe that those members of the profession who indorse the popular view on this subject, have obtained their ideas in the manner suggested. Certain it is that there is no authority to be found for it, either in human physiology or in the analogies of animal physiology. Indeed, so far as we can learn anything from the study of lower animals, the conclusion is irresistible that the sexual function is necessary only for

the propagation of the species, and not for the maintenance of the health of the individual. The capon, a castrated cock, attains greater and more rapid development than the ordinary male fowl of the same species. The ox and the horse are familiar examples of castrated males which are in no wise injured physically by the sexual mutilation which they suffer at the hands of the veterinary surgeon.

The long lives and vast labors of many celibate monks, afford ample testimony of the possibility of the enjoyment of high health by a human male without the exercise of the sexual functions. To this testimony is added the cases of such men as Newton and other bachelor scientists who have lived long and highly useful lives, though wholly continent, so far as the sexual functions were concerned.

The truth is, these organs remain in a state of inactivity, and exert little influence upon the other organs of the body until they are roused to dominance over the other vital functions by means of the stimulus of erotic thoughts. In a man whose mind is wholly free from sexual thoughts, there can be no physiological demand for sexual exercise, and there can be no suffering or injury of any sort as the result of abstinence.

In persons whose sexual organs have been unduly excited by lewd thoughts and by frequent gratification, there is formed a sort of habit, which demands exercise of the sexual organs at the accustomed periods; and if the opportunity is not afforded, unquestionably a certain degree of suffering ensues. Nevertheless, it should be distinctly understood by all persons who experience a demand of this sort, that the condition is an abnormal

one, and that it is to be relieved by repression of the cause, and not by gratification of the abnormal appetite. When such a condition exists, it may be successfully antagonized, as has been shown elsewhere in this work, by abstemiousness in diet, by exercise, and especially by mental continence and self-control.

Abnormal Sexual Appetite.—All men ought to understand that the excessive demands made by the sexual appetite in the average man among civilized people, is due to an abnormal activity and irritability of the sexual organs. The conditions of life in civilized communities directly stimulate the sexual functions to undue prominence in the vital economy. The active muscular life of the savage, in the open air, surrounded by nature in her most chaste and unemotional aspect, is far less a sensualist than the pampered and overfed child of civilization, who goads his appetite with conserves and condiments, and inflames his passions by stimulating foods and drinks, by the perusal of prurient literature, erotic poems and scandal-laden prose, and by witnessing at theatres and operas the graphic portrayal of sexual depravity in almost every phase, tinseled over with the gloss of art, but none the less potent in arousing to the highest pitch, passions which need to be repressed and calmed. The man who is most likely to manifest abnormal sexual appetites, is not the hard-fisted son of toil, whose nerves and muscles vibrate with the thrill of health; but the frail, nervous, intellectual man, whose emotional sensitiveness renders him an easy prey to temptation in the direction of sensuality, no matter how foreign to his education and his moral instincts such a course may be, and whose lowered tone of physical and

mental health weakens his will-power and self-control, and thus lessens his power of resistance to evil of any sort. The man of intellect and culture is not less sensual than the navvy because he is less tempted, but because his power of resistance is greater, and because he is surrounded by greater social safeguards.

This fact explains why the social world is now and then startled by the lapse from virtue of some man distinguished for learning or piety, and one upon whom the world is accustomed to look as being of all men most free from grossness and sensuality. Some great temptation, or some weakening of the will by loss of bodily health, has made the individual a victim to vices which he abhorred, and which he might have kept at bay had not the force of circumstances been against him. Persons of a nervous temperament are far more seriously injured by sexual excess than those of an opposite temperament.

The Physiological Rule.—The question will be asked, What rule may be followed which will insure against excess? Upon this subject, medical authorities do not agree; but certain physiological facts sustain the view that the only natural rule respecting the congress of the sexes is that the act shall occur only when reproduction is possible and desirable. A study of the lower animals reveals the fact that, in many species, reproduction occurs only at stated seasons; and it is noticeable that it is only at these times that the sexual act occurs. For example, among horses and the bovine race, the female will not allow the approaches of the male except when in heat, or when impregnation is likely to take place. The same is true with sheep. In many fowls, the testicles of the male diminish in size, and secrete no

spermatozoa through the winter months, during which time no congress of the sexes occurs.

Among lower animals, the sexual desires of the female, which appear to govern the action of the male, appear only after ovulation, familiarly known in some animals as the "rutting reason." In the human female, the conclusion of the menstrual period is marked by a similar experience, which would seem to point to a similar law existing in the human species, and which would confine the act to this period, which is also the one most likely to secure fruitful results. This would limit the indulgence of the sexual act to the number of lunar months in the year.

This doctrine will undoubtedly be too hard for those who have indulged the passions without stint, and who have been accustomed to regard as legitimate any amount of indulgence within the pale of wedlock; but we offer it with the firm conviction that it has the support of science, and will well bear the test of critical investigation.

Love, not Sensuality.—Men should divest themselves of the idea that love and sensuality are in any sense identical. The purest love is that which descends not to the lower plane of sensuous gratification. Lust buries love; the flame of carnal passion scorches and consumes the tender, Heaven-reared plantlet—pure, unselfish love. Connubial happiness may be perfect without the passionate embrace. Its purest pleasures may be thoroughly enjoyed without those grosser excitements which, while necessary for the perpetuation of the race, are not essential either for the health or the happiness of the individual. Happy indeed is the man who

has so disciplined his mind and so trained his body that he is able to hold within natural and physiological bounds the promptings of his lower nature, and may at will suppress them altogether.

The writer is well enough aware that this work will be read by those who will ridicule the ideas here advanced, and seek to cast them aside as a product of ultra asceticism, which would deny all human pleasures, and require man to abjure all but the bare necessities of life; but he is assured that the experiences of which he has been made the confidant by hundreds of intelligent men and women, justify him in the belief that many will find in these paragraphs an expression of their own sentiments, and a justification of their purest aspirations. Certainly, there are thousands of suffering women whose lives are made wretched by the demands of their gross husbands, and who long for deliverance from a bondage which is often worse than death, and will gladly welcome a doctrine which would teach their husbands self-control, and which insists that the bonds of wedlock, whatever legal control they may give a husband over a wife, do not give him the moral right to use her as a means of mere animal gratification without her full concurrence. We may even go so far as to say that from a physiological as well as from a moral standpoint, a sexual congress in which the wife is an unwilling and passive participant, is no better than the act of masturbation. Indeed, as two are injured instead of one, it may be worse. This is a strong doctrine, but what can be said to refute it? The selfishness of men will induce most of them to scout it; but the great mass of intelligent women, whose intuitions are less perverted, as with them

the sexual is subordinated to the maternal instinct, will receive it as a pure gospel, and long for its acceptance by those whom they love in spite of the gross and unlawful demands made upon them.

Quite extensive observation has convinced the writer that sexual excesses lay the foundation for a great share of the domestic infelicities which come to the notice of the public through the channel of the courts in divorce cases, and through the social scandals so industriously garnered by the newspapers. Banish lust from the marriage relation, and subject the passions to the severe rule of reason and physiological law, and half the trials of the married state will disappear at once. Men and women will be purer, better, and happier; children will be more loved, better bred, and better reared; and the family institution will rise to a higher plane.

When we consider the way in which children are conceived, thoughtlessly, heedlessly, and with mere animal gratification as the leading instinct, is it any marvel that so many show early in life, almost in infancy, the erotic tendency, which has been implanted in them; and is it any wonder that the sons and daughters of parents whose passions have been unrestrained and have grown by gratification, should possess an "easy virtue," which only requires favorable circumstances to display its weakness. Unquestionably, the "libidinous blood" is as certainly transmitted by parents who in the marriage relation indulge in sexual excess, as by those who have indulged their passions in an illicit manner.

Excess in Early Marriage.—With the newly married, excess is undoubtedly the rule, and most unhappy are the consequences in many instances. Not only is

the sacred rite of marriage desecrated, but often true love is extinguished, and a mutual repugnance springs up, which sows at the very threshold of the married life the seeds of domestic infelicity and ultimate estrangement and divorce, or something worse.

Sometimes the unrestrained passions of the young husband permit him to inflict upon the one whom he has pledged himself to cherish and protect, grave physical injuries from which years of skillful treatment may not recover her. Not a few examples of such beastly brutality have come under the observation of the author. Young women who came to the altar blooming brides, enjoying hale health, free from disease, have returned from their short honey-moon pale, feeble shadows of their former selves, prepared for a life of suffering invalidism or an early decline.

Why does not society revolt at such outrages against human rights, against morality and decency? Why does not woman assert herself, and refuse to be a mere toy, a slave to man's propensities? Unfortunately, the average woman who enters marriage, has but the faintest notion of what she is to encounter. The average mother considers it her duty to allow her daughter to grow up in utter ignorance of herself, her functions, and her rights, and takes pride in her ignorance. Tradition has spread a mystic veil over the whole subject of sexuality and procreation, and the mystery is only torn away when perhaps irreparable mischief has been done, or when the discovery is too late to be of any use.

Young man, are you about to enter the holy state of marriage? Let me counsel you. Weigh first your

motives. Are they pure or gross? Does love, pure and undefiled, reign in your heart, or sordid lust? Have you so complete a mastery of yourself that you can deport yourself like a man, or are your passions so dominant that they will drive you to behave yourself like a beast? If not sure of yourself, wait. Put yourself under discipline. If the beast is strong, you must fight the harder. Weary him down with hard, muscular work. Starve him out by abstemiousness. Crush him with an iron will and an inflexible purpose. Give him no quarter until he succumbs. Then you are safe, but you must watch. Keep the mind high up. Keep the spirit dominant. As Paul said, "Keep the body under." Enter thus the marriage state, and with a wife who is your equal, intellectually and morally, peace and joy unalloyed are assured to you.

Abortion.—Among the moral evils resulting from marital excesses, must be reckoned the heinous crime of criminal abortion. A woman finds herself the unwilling mother of an unborn child, the very thought of which fills her with repugnance and disgust. She argues, Why should I be made to suffer the pains of pregnancy and childbirth merely to gratify the animal propensities of another? She transfers the sense of injustice which she rightfully feels against the author of the wrong to the helpless creature which is the natural consequence of it, and allows her feelings to grow into actual vindictiveness, when she is ready for almost any measure which will free her from the incumbrance, and willingly resorts to the use of drugs or instruments by which the purpose may be accomplished.

Fearful indeed are the consequences of this terrible

crime. Often enough the mother's life is sacrificed or her health forever shattered. No one could be more wretched than the woman who has brought upon herself the physical woes resulting from this unnatural crime. The violence done the delicate tissues of the womb often sets up most terrible inflammations, the results of which can never be wholly effaced, if the sufferer does not pay the penalty for the crime with her life. Sometimes the most persistent efforts to compel the womb to give up its treasure do not succeed, although the fœtus may be so mutilated that at birth the human form is scarcely recognizable. This may be fairly considered as the cause of some of those terrible monstrosities which have sometimes been attributed to some demoniac agency, and which may still be charged to motives that are certainly something less than human,—may we not say devilish?

The idea held by many that the destruction of fœtal life is not a crime until after "quickening" has occurred, is a gross and mischievous error. No change occurs in the developing human being at this period. The so-called period of "quickening" is simply the period at which the movements of the little one become sufficiently active and vigorous to attract the attention of the mother. Long before this, slight movements have been taking place, and from the very moment of conception, those processes have been in operation which result in the production of a fully developed human being from a mere jelly drop, a minute cell. As soon as this development begins, a new human being has come into existence,—in embryo, it is true, but possessed of its own individuality, with its own future, its possibilities of joy,

grief, success, failure, fame, and ignominy. From this moment, it acquires the right to life, a right so sacred that in every land to violate it is to incur the penalty of death. How many murderers and murderesses have gone unpunished! None but God knows the full extent of this most heinous crime; but the Searcher of all hearts knows and remembers every one who has thus transgressed; and in the day of final reckoning, what will the verdict be? Murder?—MURDER, child-murder, the slaughter of the innocents, more cruel than Herod, more cold-blooded than the midnight assassin, more criminal than the man who slays his enemy,—the most unnatural, the most inhuman, the most revolting of all crimes against human life.

But let us not condemn alone the weak, half-crazed woman who has been compelled to become a mother against her will, simply to gratify a sensual husband. Who will lay upon her more censure than upon the man who is responsible for the first sin? He deserves at least an equal share of condemnation. Let husbands weigh well this fact, and act accordingly.

"*Marital Rights.*"—Several times have we been approached by husbands with complaints that their wives denied them the exercise of their "marital rights." What are a man's "marital rights"? Certainly no man has a right to treat his wife as a prostitute. The man who considers his wife as simply a means of gratifying his animal propensities, is unworthy of a wife. He is worse than a beast, or at least has less sense in this particular than most beasts, for, as a rule, a male beast will not approach a female who is not in a condition in which she desires sexual congress, and is prepared to

engage in the act fruitfully. We do not hesitate to say that no man has the right to demand of his wife that she shall minister to his passions simply for his personal gratification. It is no part of a woman's marital obligations to thus minister to and encourage a depraved and artificially stimulated appetite. A woman is sovereign over her own body, married or unmarried; and no man not wholly given over to selfishness and grossness, will attempt to invade her rights for his personal gratification.

But, says the passionate husband, whose wife lives upon a higher plane of being, what shall I do?—Conquer yourself. Subdue your lustful cravings. Repress the animal by the development of the intellectual and spiritual. Fight down and trample under foot the beast that rules you. Rise into a higher sphere. Leave behind and below you the gross and sensual. Do this, and you will become a new man. You will breathe a purer and a better atmosphere. Love will no longer mean lust and sensuality, but will become a purer passion, partaking less of sense, and more of that divinity which gave it origin.

Cheating Nature.—Numerous devices are adopted by both married and unmarried for the purpose of defeating the natural results of sexual indulgence, the nature of which it is unnecessary to notice here. It is sufficient to say that all are detrimental, and particularly that which cuts short the act before the occurrence of ejaculation. Women, in particular, are the greatest sufferers from this fraudulent proceeding, which has been termed "conjugal Onanism," and which is without doubt the veritable sin for which Onan suffered. If this sexual

sin is of sufficient gravity to be named in Holy Writ, and to merit so summary a punishment by the hand of the Almighty himself, surely it cannot be considered a trifling matter. Thousands of men and women are suffering to-day with curious and varied forms of nervous and other disorders, the real cause of which is simply addiction to this sexual vice. The ingenuity of man has not yet devised a means by which the immutable laws of nature can be abrogated or violated with impunity. The penalty of disease is certain to follow sooner or later, no matter what subterfuge is employed.

MENTAL VICE.

Many young men who have never been guilty of an overt act of sensuality, allow themselves to indulge in mental vice almost without restraint. The mind is permitted to dwell upon themes the most vile, to revel in all the filthiness of licentiousness. The imagination, stimulated to the highest possible degree, excites the body, and produces all the physical results of actual sensual indulgence. Indeed, the nervous excitement occasioned by this mental lasciviousness, is far more intense and exhausting than physical concupiscence. These filthy dreamers may imagine themselves pure because they do not commit overt sin; but He who knows all hearts, who reads the innermost thought as clearly as the most open act, the All-seeing eye, beholds these mental fornications and adulteries, and writes them in the record of human character. What a fearful record this must be if every thought appears in all its monstrous hideousness. Young man, you who have abandoned

yourself to mental lust, weigh carefully this thought. Would you like to have your mother look in upon your sensual mind, or know of its obscene wanderings? Would you respect your father if you knew his mind to be such a quagmire of mental filth as your own? Can you respect yourself when you reflect upon the grossness of your own thoughts, the vile imaginings to which you have given loose rein?

Know well, young man, your sin will find you out. You may profess to be a man above reproach. Perhaps you are a communicant, a member of the Y. M. C. A., and an active worker in Christian enterprises of various sorts; but this will not save you from becoming stamped with the mark of concupiscence. Your mental adulteries are not hidden, even from human eyes. An unclean mind reveals its true character in that wonderfully accurate mirror, the human face. Every thought, every changing mental state, finds silent but emphatic expression in the face. When rage, hate, envy, agitate the brain, the muscles of the face mold it so as to fit the mental state, and these awful passions stand out in bold relief. Sorrow and grief, joy and happiness, produce an equally striking picture. So also with lust. A mind filled with obscene and lustful thoughts, makes a corresponding picture upon the face. With photographic accuracy the muscles of expression portray the mental abominations within. By and by the transient expressions of the face become fixed, when the mind is allowed to dwell upon unclean things, and the face is indelibly stamped with the insignia of vice. As we mingle with young men and boys, as we pass them on the street, how many such faces do we see! How few faces por-

tray a character unstained by lust, unsoiled by moral filth!

But the mental and moral consequences of this form of vice are by no means the only results. Those who indulge in mental lasciviousness with the idea that they may thus gratify their sensual desires without incurring the risks of physical harm which other forms of sexual excess involve, deceive themselves in vain. We have met many cases in which all the effects of prolonged addiction to self-abuse were the result of mental vice alone. Indeed, the prolonged and intense excitement occasioned by an active imagination abandoned to lust, is in certain respects more harmful, and is certainly more exhausting, than almost any other form of sexual abuse. No form of sensuality produces such speedy and complete emasculation, or loss of sexual power, as this; and no class of cases offers so little hope of recovery from the effects of transgression.

Young man, have you become a slave to a sensual mind? Are you one of those mental adulterers whose lecherous imagination compels every woman to be the victim of his lust, and hesitates not to debauch for his vile pleasure the purest and the best? who loiters about the streets, gazing with lustful eyes upon every passing female? or visits the theatre, the lecture hall, even the house of God, for the purpose of discovering new victims for his foul but fickle fancy? who goes up and down in all the walks of society, seeking for beauty which the insatiable beast of passion within him may devour? Do you belong to this horrible class of satyrs, monsters in human shape, moral assassins, cowardly, sneaking, conscienceless invaders of virtue, from whose vile embrace

the purest and loveliest have no protection? If you do, let me say to you that destruction awaits you. Swift retribution will fall upon you. You shall find yourself accursed in this world and the next. The pure joys of true love, of domestic peace and bliss, you shall never taste; and at the great day, when all men are called upon to render an account of their deeds, when every hidden thought stands out in boldest characters before the Judge of all the world, than shall your mean and filthy soul be weighed, and you will be sent away with those of whom it is said, "I never knew you."

Young man, if you have taken the first step down toward this condition of mental infamy, call a halt at once in your mind-wanderings. Cease your vicious imaginings; and by constant watchfulness and prayer, endeavor to win back your unchaste mind to paths of purity and virtue.

Diseases of the Sexual Organs.

NEARLY all forms of sexual disease are the result of sexual vices of some sort. The sexual organs are no more likely to become disordered than are other organs of the body, unless the laws which relate to their healthful activity are in some way transgressed. It does sometimes happen, however, that diseases of other portions of the body result in disorders of the sexual functions; but those maladies which originate in this way, play a very insignificant part in the pathology of this important class of diseases.

One conspicuous feature in this class of maladies is the remarkable influence they exert upon the health of the general system, which often seems to be vastly out of proportion to the local manifestations of disease. The explanation of this fact is found in the potent influence of reflex activity. There are in the body three great centers of morbid reflex activity,—the brain, the nerve centers which preside over the digestive organs, and those which control the sexual and urinary organs. Among them all, perhaps the most powerful and far-reaching in its influence is the last-named, the genito-

urinary group. The close relation of this group of nerve centers to those which control the organs of digestion, as well as to the entire spinal cord, and through it with the brain, gives an opportunity for the widest and most varied influence to be exerted when diseased conditions set up a train of morbid processes in any part of the various organs under their immediate control.

Thus it is that diseases of the sexual organs which are seemingly of the most trifling character, sometimes produce the most profound debility of the whole system, often to such a degree, indeed, as to give rise to the opinion that some grave organic disease may be sapping the vitality of the patient.

SEXUAL NERVOUS DEBILITY.

The long list of varying symptoms which have been grouped under the head of Sexual Neurasthenia, or Sexual Nervous Debility, presents such a formidable array of morbid sensations and conditions as to almost lead to the supposition that a person in this condition is compelled to experience every possible symptom or morbid sensation to which human flesh is heir.

Symptoms.—Pains and other unpleasant sensations in the head, pressure at the back of the head, unpleasant sense of fullness in the forehead, dullness of intellect, confusion of thought, want of readiness of thought, a sort of abstraction of the mind, nervous irritability, morbid fears, perversity of temper, fickleness of disposition, tenderness of the eyeballs, sensitiveness of the eyes to light, specks before the eyes, giddiness, roaring and other sounds in the ears, twitching of the muscles in various

parts of the body, numbness of the arms, limbs, or other parts, tenderness of the spine, backache, pains in the loins, wandering pains throughout the body, various dyspeptic symptoms, abnormal inactivity of the bowels, irregular action of the liver, profuse or scanty secretion of urine, abnormal sexual irritability, or the opposite condition,—these are but a few of the symptoms which harrass and render miserable the sufferer from sexual neurasthenia.

Causes.—The most common of all causes of this disease is self-abuse, begun at an early age and continued until after puberty, or acquired later and practiced to great excess. Sometimes it may arise as the result of marital excesses, although in the latter case it is generally possible to trace the first beginning of the disorder to the practice of masturbation during childhood or youth.

Treatment.—Sexual neurasthenia is an accompaniment of nearly all forms of sexual disorders, and, depending as it does upon these local disorders or morbid conditions for its cause, it requires no specific treatment other than such as may be indicated for the removal of the local disease, and such measures as will build up the general health, and restore the wasted nervous energies.

Among the most valuable means for accomplishing the last-named purpose are the following:—

Proper Exercise.—Proper exercise is not only an excellent nerve tonic, but it acts in a most powerful manner as a sedative in repressing nervous irritability. Daily exercise in the open air should be taken to the extent of producing genuine fatigue. The state of extreme exhaustion should never be reached, as this will

weaken rather than strengthen the wasted nervous system. Various gymnastic exercises are also valuable, and should be taken in a systematic and regular manner.

For full directions respecting exercises, see the chapter devoted to that subject in a preceding portion of this work.

Diet.—A sufferer from nervous debility should give scrupulous attention to diet. This is made necessary not only by the special requirements of a weakened nervous system, but by the fact that almost invariably the digestive organs are weakened, the lowered nerve tone producing a condition of atony which may be well described as *slow* digestion. Food should be sufficient; good in quality, but moderate in quantity. Stimulating condiments of all sorts should be sedulously avoided. Tea and coffee, and all other narcotics and stimulants, particularly alcohol and tobacco in every form, should be entirely discarded. The diet should consist chiefly of fruits and grains, with an abundance of milk, and some of the better classes of vegetables. Two meals a day will be found preferable to three, provided they are taken with proper intervals between, and the avoidance of supper will be found perfectly conducive to healthful and refreshing sleep. A person suffering with this disease should read carefully the chapters entitled "Stomachs" and "Biliousness," and give careful heed to the suggestions there made.

Sleep.—Regular and abundant sleep is essential. These persons often complain of always being tired, and particularly in the early part of the day, no matter how much sleep has been taken. This sense of exhaustion

is not often real weariness, being most frequently a morbid sensation like many of the other symptoms which these sufferers experience; but it is usually a very distressing symptom, and disappears only when the patient has largely recovered his normal vigor and nerve tone. Sometimes the morning languor is due to distressing and exhausting dreams through the night, the influence of which upon the nervous system is undoubtedly almost as bad as though the individual had actually encountered the experiences through which he wanders in the mazes of dream-land.

Bathing.—The morning bath should not be with cold water, which is seldom borne well by this class of persons, but with water of a temperature a little below that of the body. This is a most excellent means of counteracting the languor and lassitude referred to, and of stimulating the vital processes in such a way as to secure an improvement in the general nutrition.

The various methods of taking baths will be found briefly described in a subsequent chapter. For the morning bath, a sponge or towel bath is to be preferred to a full or shower bath. Hot baths are enervating in character. The bath should always be cool enough to leave the patient with a lively glow after a vigorous rubbing.

Sponging the spine with water as hot as can be borne, say 110° to 120°, is a very excellent means of relieving backache and exhaustion. Sponging alternately with hot and cold water, one-half a minute each, produces better effects than hot water alone. This treatment may be varied by sitting on the edge of a tub, and allowing the assistant to pour hot water from a dipper upon the spine. This hot pouring is one of the most effective means of relieving backache.

SPERMATORRHŒA.

When used in its strictest sense, this term applies to an involuntary and unconscious escape of the seminal fluid without sexual excitement; but common usage has given to it a wider significance, and we shall include under this head those conditions in which there occur involuntary seminal losses of any sort. Spermatorrhœa is not a disease of the testicles, and sometimes exists, indeed, when there is no disease of any of the genital organs. The involuntary discharges are the result of an abnormal excitability of the nerve centers which control the sexual organs. This condition results from the weakness and exhaustion following some form of sexual abuse. In the majority of cases, as we shall see, the leading local morbid condition is an irritability or abnormal sensibility of the urethra, particularly that portion nearest the bladder, known as the prostatic urethra. This portion of the canal is largely supplied with sensitive nerves, and surrounded with the ejaculatory muscles, by the contraction of which the seminal discharge is produced.

Varieties of Spermatorrhœa.—There are three distinct varieties of this disease, which are really different stages in the morbid process which lies at the foundation of the malady. These three conditions may follow one another as the disease progresses, or they may all exist together.

The three conditions are known, respectively, as (1.) Nocturnal emissions, or pollutions; (2.) Diurnal emissions; (3.) Spermatorrhœa, or, as it has been termed, spermorrhagia. We will consider each of these maladies or morbid conditions separately :—

NOCTURNAL POLLUTIONS, OR WET DREAMS.

Probably no form of sexual disease so often comes to the notice of the physician as this. The newspaper advertisements of quacks, and the advertising pamphlets which are scattered about the country, abound with graphic descriptions of the terrible consequences of this disease, and are the occasion of great alarm to many who are not really suffering so seriously as to demand medical attention.

Symptoms.—The usual symptoms complained of by this class, are those which have been enumerated under the head of "Sexual Nervous Debility," to which are added frequent seminal losses during sleep, either with or without lascivious dreams, and often various local symptoms, particularly a smarting or burning accompanying the passage of urine, dribbling after urination, pains in the groins or the testicles, muscular twitching or dull pains in the perineum, or fork of the thighs, abnormal excitability of the parts, as indicated by frequent or painful erections, or the reverse condition,—unnatural coldness or numbness of the genitals. The patient sometimes notices that the left testicle hangs a little lower than the right, which he also attributes to the disease, as he does many other symptoms which have no relation to it. This condition of the left testicle is perfectly natural, and need be no cause for alarm. Unnatural tenderness, softness, or shrinking in size of the testicles, are symptoms which are sometimes present, and which are evidences of disease.

Emissions never occur until after puberty, and generally come on after the habit of self-abuse has been

abandoned, or greatly diminished in frequency. At first, they may occur only at intervals of a week or two. Gradually, the frequency is increased until they may occur every night, or even as often as four or five times in a single night, rapidly reducing the patient to a most wretched condition of physical, mental, and nervous exhaustion.

It must not be imagined, however, that a loss of this kind is in itself evidence of serious disease, although it is undoubtedly true that with a perfectly healthy and continent man, who lives a quiet and normal life, not allowing his thoughts to dwell upon such subjects as produce frequent and abnormal excitement of the genitals, involuntary pollutions would never occur; and in individuals who closely approximate the above-named conditions of life, nocturnal pollutions certainly occur with very great rarity. The question will arise, How often may such losses occur without serious impairment of health, or without being properly considered evidences of disease? To this we must reply that there can be no absolutely positive rule established for every individual, but it may be said that if such losses do not occur more frequently than once in three or four weeks, in persons whose sexual organs have not been previously weakened by abuse or by more frequent losses, and if such losses are not followed by depression or other unpleasant symptoms, the individual may be considered to be in a condition of health. At least, no remedial interference is demanded. There is certainly very great diversity in the ability of individuals to endure losses of this kind. In some persons, they occur as often as once or twice a week for years, without producing, apparently, any very

grave results; while in others, a loss even much less frequently will each time be followed by extreme nervous irritability of disposition, exhaustion, backache, and the general group of symptoms present in these cases.

It should be noted that the unpleasant effects of nocturnal losses, though usually felt most intensely on the following day, sometimes are not observed until the second or third day afterward. There seems to be an effort on the part of the system to maintain its usual condition, which succeeds for a day or two, and then gives place to the nervous collapse from which most of the symptoms arise. In some persons, these symptoms are quite evanescent, lasting but a few hours; while in others, they last several days, and almost totally unfit him for physical or mental exercise. Frequently the depression arising from this cause is so great as to produce most profound melancholy. The individual is plunged into a state of such utter wretchedness and despair that life seems to be intolerable; and when this condition is made almost constant, by the frequent repetition of the loss, it is not remarkable that the mind sometimes gives way, so that reason becomes dethroned, and the poor victim becomes an inmate of an insane asylum, or ends his sufferings by suicide.

It is a matter to be greatly regretted that the average medical practitioner does not properly understand disorders of this class, nor appreciate the grave symptoms to which they may give rise. The young man suffering in this way, who calls upon his family physician, and explains to him his condition, is generally met by the assurance that the difficulty is wholly in his imagination, that he has probably been reading some quackish adver-

tisement or publication, and that all he has to do is to give the matter no attention, and he will suffer no harm. He is assured that the losses from which he is suffering are "perfectly natural," that it is an indication of health rather than disease, and that he need not have given himself any concern about it.

We have met scores of young men, who, through receiving such advice as the above, have been led to allow the malady to gain ground, continuing year after year without attention, until it had reduced them to great physical wretchedness, mental enfeeblement, and almost total impotence. While the advice may be entirely suitable in a certain class of cases, the wholesale manner in which it is administered by ignorant practitioners to young men suffering in this way, is certainly productive of a vast amount of harm, although those offering the advice are certainly not open to the charge of dishonesty, and undoubtedly think themselves to be acting in the best interests of their patients.

Causes.—Very little need be said under this head in this connection, as those who have read the preceding chapters of this work must be already thoroughly acquainted with the fact that the condition of exhaustion and abnormal excitability of the spinal nerve centers, which are the immediate result of this disease, are almost exclusively the result of sexual excesses of some sort, and particularly of the practice of self-abuse. We have, however, met a few cases in which it was impossible to obtain any evidence that this practice had been indulged, or indeed that there had been any form of sexual excess. In several cases, young men have declared to us that, although they had been perfectly continent all their lives,

and had never indulged in the practice of self-abuse, having been properly warned against its effects, yet they were suffering frequent seminal losses, and from all the symptoms of sexual exhaustion. In these cases, the disease was traceable to what we have elsewhere considered under the head of "Mental Vice." The mind had been allowed to wander upon sexual subjects to a great extent, producing very frequent and prolonged sexual excitement, as the result of which an abnormal activity of the secreting organs was produced, together with fullness of the seminal vesicles. In dreams, the thoughts which had been uppermost during the waking hours, took possession of the mind, and this, together with the local conditions, was sufficient to give rise to seminal losses. Under these circumstances, the nocturnal emissions might be regarded as a sort of safety-valve through which the abnormal excitement and irritability might be worked off, and the occurrence might justly be regarded as less injurious than the continuous excitement which it, for a time at least, allays.

The injury resulting to the system from these pollutions, whether voluntary or involuntary, indeed from every form of sexual excess, arises not from the loss of seminal fluid, but from the intense excitement of the nervous system. Hence, it is easy to understand that excitement of this kind, if long maintained, even though not reaching the highest degree of intensity, might be of greater damage to the system than the momentary excitement attending ejaculation.

In cases of long standing, and indeed not infrequently in recent cases, it will be found that persons suffering with nocturnal losses have an abnormal sensitiveness or

irritability of the prostatic portion of the urethra. This is indicated by smarting or burning during or after the passage of urine, by dribbling of the urine after urination, by the escape of a small amount of clear fluid from the urethra during movements of the bowels, and sometimes by a soreness or dull pain in the perineum, or fork of the thighs; in severe cases, by pain during ejaculation, and sometimes by the passage of bloody semen. This irritability of the prostatic urethra may be ascertained by the passage of a bougie, or sound, or by pressure upon the part with the finger passed into the rectum.

This urethral irritability is in most cases the immediate existing cause of nocturnal losses. Irritation, or congestion, involving, as it does, the mouths of the seminal or ejaculatory ducts, is reflected to the nerve centers controlling the muscles surrounding these parts, so that a degree of excitement much less than the amount ordinarily required to produce ejaculation, is sufficient, especially during sleep, to produce the venereal orgasm, or seminal loss.

Treatment.—The treatment of this class of cases requires great prudence, judgment, skill, and experience. That a man who has not made a special study of the subject is not prepared to treat successfully cases of any degree of gravity, is evidenced by the fact that so eminent a man as Prof. Niemeyer has asserted that medicine is powerless to afford any very great degree of relief in these cases. That this is a mistake, however, is proved by the testimony of a large number of English and German specialists, whose success in the treatment of this malady justifies the statement made by Acton, of London, that "the prognosis of an ordinary case is very

favorable, provided the patient will honestly aid the surgeon in effecting a cure." The author is also justified by the results of his own experience in claiming for the treatment of this class of cases the most gratifying success. Indeed, there is probably no class of functional disorders which yield more readily to thorough, rational, and scientific management than does this. Of course, recent cases are much more readily controlled than those of long standing, but it is safe to say that there are few, if any, cases which cannot be greatly relieved, and the majority can be substantially cured by the adoption of the proper means.

To Control the Losses.—First, we will consider such measures as may be adopted to prevent the occurrence of the losses, and chief among these we must place mental control.

Dreams are but reflections of our waking hours. In dream-land, we live over the experiences of the day. Dreams may be said to be an echo or a shadow of our voluntary thoughts and acts; hence it becomes a matter of the gravest importance that the mind should be thoroughly purged of all unchastity. During sleep, when the will is less active, the passions which have been aroused and tantalized by ungratified excitement, will assert supremacy, and carry the individual through all degrees of sensuousness. On the other hand, when the mind is, during the waking hours, kept under thorough control and free from impure thoughts, the dreams will be far less likely to assume a lascivious character.

Voluntary Control of Dreams.—Even during sleep, the will is not entirely dormant. If the will is energetically employed during the waking hours, instantly re-

pressing the first suggestion of impurity, the habit of the waking hours will be maintained even during sleep, and the first suggestion of erotic ideas, even in dreams, will arouse the will to resistance. By determined and persistent effort in this direction, this practice of the will may be made so vigorous as to arouse the individual from sleep at the first suggestion of sensual ideas, and in time to prevent the occurrence of the sexual paroxysm. This is a principle of the utmost importance in the treatment of this disease, and should be thoroughly comprehended and continuously employed by one who is seeking deliverance from this disgusting disorder.

Even after the excitement attending the emission has begun, a sufficiently vigorous effort of the will may repress and shorten it; and by continued effort in this direction it may, after a time, be brought fully under control.

Success by this means, however, requires the most faithful and persevering effort. Resistance should be made in every instance. A single failure to exert the will restores the malady to full control, and makes it necessary for the patient to fight the entire battle over again. The only cases of this disease which are hopeless are those in which the mind has become so debased, and the will so weakened, that both body and mind have become a helpless prey to evil thoughts, and to "the passions' vengeful reign." But if the patient goes about this work in real earnest, and wages a vigorous warfare against every form of sensuality in thought or act, he may feel the utmost confidence of success.

As aids to proper medical control, it is important that the patient should cultivate such society as will

encourage good and elevated thoughts. The suggestions made and the directions for the cure of self-abuse are all applicable to cases of this sort, and should be carefully read.

Diet.—At least a second place should be assigned to the influence of diet when properly regulated in controlling these losses. The patient who overeats, indulges in stimulating or exciting foods, ices, pastries, late suppers, and other dietetic digressions, is certain to suffer much more frequently in this way than he who carefully adapts his dietetic regimen to the requirements of health. The diet should be thoroughly nutritious, but unstimulating. Animal food, taken in great abundance, exerts an undoubted influence in exciting the sexual organs, and producing involuntary losses during sleep. A stimulating diet also produces such a state of the nervous system as predisposes to erotic thoughts, and renders mental control much more difficult. An undoubted influence is also exerted through the urine. Animal food, in any but small quantities, especially if the patient is not habitually engaged in vigorous muscular exercise, produces a condition of the urine which is likely to excite irritability of the bladder, or to aggravate an irritable condition of the prostatic urethra already existing.

Condiments of all sorts are particularly harmful. A person who has indulged in a heavy supper, in which soup or other foods containing a considerable amount of cayenne pepper has been taken, will recollect a smarting and burning pain in the rectum the following morning. This is due to the fact that pepper, as well as most other spices, is not soluble in the digestive fluids, a con-

siderable portion remaining in the alimentary canal, and acting as a direct irritant to the mucous membrane of the intestines, all the way down. The irritation is felt only in the lower part of the rectum, as it is the only portion abundantly supplied with sensitive nerves. The close proximity of the ejaculatory ducts and seminal vesicles renders an irritation of this kind especially provocative of sensual desires and excitements. Hence nothing could be better calculated to bring on involuntary excitements during sleep than the use of these condiments.

Tobacco, alcoholic liquors, even tea and coffee, all act directly or indirectly, in greater or less degree, upon the sexual system, and their use should be *entirely discarded.*

Hot water should be liberally used as a drink for the purpose of diluting the urine, and thus preventing any irritation arising from a too concentrated condition of this secretion. If the digestion is feeble, so that cold water is slowly absorbed, water should be taken at a temperature a little above blood heat, or at about the temperature at which tea or coffee is usually taken. The best time for taking hot water is about one hour before eating, and half an hour before retiring at night. Six or eight glasses may be taken a day with advantage. Little fluid should be drank at meals, and ice-water should be avoided at all times. As a substitute for tea and coffee, hot milk may be taken with advantage.

Foods abounding with fats, rich cake, preserves, pickles, and all articles difficult of digestion, should be carefully and habitually avoided. These articles produce indigestion and gastric irritation, which, acting

reflexly upon the genital organs, produce local excitements that otherwise might not have occurred.

We have often known young men to relieve themselves of this unhappy condition by adopting the vegetarian diet, although this cannot be offered as a panacea or a specific for this or any other morbid condition. One who is thoroughly desirous of recovering his health, will be willing to make any sacrifice required for the accomplishment of his purpose. If health is worth anything, it is worth working for. It is worth denying the appetite and curtailing depraved tastes; and there is this to be said for the encouragement of one engaged in this struggle, that the conflict with appetite, if manfully and faithfully fought, is usually a brief one. Appetites and cravings which at first were hard to be resisted, gradually weaken under the influence of persistent control, until after a time their clamorings cease, natural tastes and instincts are restored, and the relentless rule of perverted desires and depraved tendencies closes. The consciousness of freedom which one experiences who has successfully fought this battle, is ample compensation for the mental effort and the self-denial required to win the victory.

Exercise.—The influence of vigorous muscular exercise in calming and controlling the passions, has been sufficiently dwelt upon elsewhere, and the observations made need not be repeated here. A sufficient amount of exercise should be taken daily to produce gentle muscular fatigue, though complete exhaustion should be avoided. The quantity of exercise and how it should be taken, may be learned by reference to the chapter on this subject. The effects of muscular exercise is to

distribute the blood well through the body, thus preventing local congestion, and to work off the condition of plethory and nervous erethism which are predisposing causes of the disease under consideration.

Sleep.—Attention to the conditions of sleep are of the utmost importance in the treatment of this malady. Special attention should be given, 1. To the position of the body during sleep. Every sufferer from this malady is aware of the fact that these losses almost always occur while sleeping upon the back. This allows the blood to accumulate in the spinal cord, and also overheats this part of the body, thus in two ways producing abnormal excitability of the nerve centers controlling the sexual organs. Emissions are hence likely to occur when the body is in this position, when the organs have been weakened by abuse, or when local irritability exists.

It is for this same reason that nightmare occurs from sleeping upon the back, in connection with irritability of the digestive organs, arising from indigestion, or the attempt to dispose of a late or indigestible supper. The best position for sleeping is upon the side, and preferably upon the right side. This relieves the nerves at the back of the trunk from the pressure of the abdominal organs, and prevents overheating of the spine, and undue accumulation of blood about the nerve centers. Those who are restless during sleep, often changing position without waking, may succeed in preventing themselves from getting upon the back by fastening about the waist a towel, in the center of which a knot has been tied, inclosing a small stone or other hard object. The pressure of the knot upon the spine will

produce sufficient disturbance to awaken the individual from sleep, should he turn upon the back. Patients have sometimes made for themselves a harness for this purpose, which is more easily retained in position than a towel.

Various elaborate devices have been constructed for waking the patient from sleep on the occurrence of sexual excitement, among which are various forms of "rings." The success of devices of this sort depends entirely upon the promptness with which their suggestions are heeded. A person who neglects to give immediate attention to the gentle reminder offered by these devices, very soon disregards them altogether, so that they come to be of no avail. All of them are of far less value than the suggestion previously made to so charge the will with the duty of resisting these tendencies that it will be aroused to a vigorous resistance at the first suggestion of danger.

2. Avoid morning napping. Nocturnal losses almost always occur in the morning, when the sleep is less profound than in the early part of the night, and the imagination begins to become active in the production of dreams. It is very likely to occur during the second nap, if the individual, after awakening toward morning, again falls asleep, as this second sleep is very likely to be attended by dreams and half-waking reveries; hence a second nap should be sedulously avoided. When the loss occurs at a regular hour in the morning, as is sometimes the case, it is well for the individual to provide himself with an alarm clock, which should be set half an hour before the usual time for the loss to occur, and he should promptly get up and dress himself as

soon as the warning is given. Dozing in bed is simply flying in the teeth of danger, and must on no account be indulged.

3. Fullness of the bladder or bowels is very apt to provoke an emission, and hence both should be emptied before retiring, and it is well to form the habit of awakening one's self in the middle of the night to relieve the bladder. A person who is much troubled from this cause, should avoid drinking in the evening.

It is not necessary to move the bowels at night if there has been a proper evacuation in the morning after breakfast, which is the most natural time for the bowels to move; but if they have not been moved thoroughly during the day, some means should be taken to secure an evacuation at night, and if necessary, the enema may be resorted to.

4. A person suffering from nocturnal losses should avoid sleeping on feathers or on a bed which is very soft. The bed should be rather hard. A cotton, wool, or hair mattress is the best. The bed covering should be as light as is consistent with comfort. Feather pillows should also be avoided, as they tend to heat the head. A thin pillow of cotton or hair is preferable.

5. The sleeping-room should be well ventilated, and only slightly heated. A heated or poorly ventilated room is a powerfully predisposing cause of sexual excitement during sleep.

6. Before retiring at night, the patient should avoid any sort of mental exercise which will produce very great excitement or exhaustion of the brain or nerves. A half hour's walk in the open air, or, if the weather is inclement, exercise with dumb-bells or Indian clubs is an excellent preparation for sound and refreshing sleep.

Care of the Bowels.—Careful attention to the bowels is a matter of first consequence in these cases. Constipation leads to congestion of the pelvic organs, and the violent efforts required to move the bowels congest and irritate the seminal vesicles, the prostatic portion of the urethra, and indeed the entire genitals. The bowels should be kept regular and the movement soft by means of an abundant fruit diet and prompt and regular attention to the calls of nature. If the stools are very dry, the difficulty may often be overcome by wearing a moist bandage, called "Neptune's girdle," around the lower part of the trunk at night, to be applied as follows: Wring a towel out of cold water dry enough so it will not drip. Wind around the body, and cover with three or four thicknesses of dry flannel. On removing in the morning, rub with the hand in cold water, and dry by brisk rubbing with a dry towel. Kneading and percussing the bowels three or four times a day is also an advantageous measure. If the stools are not dry, but there is simply a want of inclination to move the bowels at the proper time, this difficulty may be removed by simply injecting into the bowels a small quantity of glycerine and water, a teaspoonful of glycerine to three or four tablespoonfuls of water being about the right proportion in quantity. Use this about one hour after breakfast, the time when the bowels naturally move. If there is an irritability about the rectum, wash it out with half a pint of cool water after each time the bowels move.

Bathing.—Daily bathing is essential, not only to maintain the health of the skin, but to encourage the assimilative processes by which the general nutrition is maintained. The cool morning bath is one of the best

means of toning up an exhausted nervous system. It may be taken by means of a sponge or a towel, as directed elsewhere in this volume. Either pure water may be employed, or with a little ammonia, vinegar, or salt. These should be used as follows: Ammonia water, one dram to the quart of water; vinegar, one part to four of water; salt, a tablespoonful to the quart of water. A soap-and-water bath should be taken once a week. In cold weather, the above may be followed by an oil rub, to prevent taking cold. A cool or tepid sponge bath should be taken at least three or four times a week, and it is better that the bath should be taken daily.

The sitz bath, described elsewhere, is a most excellent means of relieving local congestion, which is one of the most potent causes of this malady. The temperature of the bath should be about ninety-two degrees, and the bath should be continued twenty or thirty minutes. It is best taken just before retiring at night. Persons who are strong physically, may take this bath every night before retiring. In other cases, in which the general health is much impaired, the bath had better be taken not more frequently than three or four times a week.

The wet girdle should be worn at night, especially in cases in which there is a tendency to constipation due to deficient secretion, which is the case when the stools are inclined to be hard and dry. The girdle may be worn at night only, or in the warm seasons of the year, day and night. In cold weather, it is best to remove the wet girdle in the morning, replacing it by a dry flannel to be worn during the day. The effect of the wet girdle is to

stimulate the secreting glands of the intestines to increased activity, causing them to throw into the intestines a large amount of fluid, the deficiency of which is one of the most frequent causes of constipation, this being, as we have elsewhere observed, a very powerful predisposing cause of nocturnal losses.

In connection with the use of the girdle for relief of constipation, the bowels should be thoroughly kneaded and percussed with the hands several times a day, particularly on rising in the morning. The effect of this is to increase the peristaltic movements of the intestines, thereby encouraging normal activity. Move the bowels at a regular time each day, the proper time being half an hour to an hour after breakfast. If necessary, the enema must be employed.

The enema is also an excellent means of relieving local irritability. When employed for this purpose, the quantity taken should not be large, not more than one or one and a half pints, and the temperature of the water should be considerable lower than that of the body, say seventy or eighty degrees. It should be slowly introduced, and should be retained fifteen or twenty minutes. The cool enema should be taken at night, half an hour before retiring.

Applications to the Spine.—One of the most effective means of relieving the irritable weakness of the lower portion of the spinal cord, which is the direct cause of seminal emissions, is to be found in the application of heat, either in the form of hot fomentations, sponging with hot water, or alternate hot and cold sponging. The hot pour, administered to the lower portion of the spine, the patient sitting upon the edge of a wash-tub or other

receptacle while water is poured upon the spine from a dipper, is a very efficient mode of applying heat to this part of the body. The effect of these applications in controlling the morbid activity of the sexual organs is very marked indeed, and may be considered one of the most important means that can be employed in these cases.

Use of Sounds.—Much benefit may be derived in many cases by the employment of the steel sound, or wax bougie. By the skillful use of this instrument, the irritability of the urethra may be gradually obliterated, and its morbid reflex action, upon which the occurrence of the nocturnal losses depends, may be checked. This treatment cannot be well employed without the instruction of a competent physician, and should be rarely attempted as a means of self-treatment. We should also state that we have little confidence in this manner of treatment, except when employed in conjunction with other measures; but when thus used, we have found it of very great service in hundreds of cases.

The cooling sound, or psychrophore, is an instrument which combines the advantages of the sound with the application of cold directly to the urethra. The instrument is essentially a double metallic catheter, so constructed that a stream of cold water can be passed through it, while it is held in position for a sufficient length of time to produce a decided effect upon the urethral passage. This instrument is the invention of Prof. Winternitz, of Vienna, from whom we had the pleasure of receiving suggestions respecting its use a few years since, while visiting the amiable professor at his famous medical establishment at Kaltbad, a little mount-

ain village in the vicinity of Vienna. We have employed this instrument for a number of years, and with excellent results in certain cases, but cannot recommend its indiscriminate use.

Electricity.—This is certainly one of the most valuable of all local methods of treatment which have been suggested for this malady. Of the various forms of electricity, the galvanic and faradic currents are the only ones of practical utility in these cases. The faradic current has a decidedly beneficial effect in toning up the weakened nerve centers, and restoring lost tone in the parts diseased. Galvanic electricity is chiefly useful in relieving congestion of the parts, and lessening the irritability of the nerve centers of the spinal cord. The electricity may be applied to the spine and external organs, or more effectively still by the steel sound passed into the bladder so as to bring the whole urethra under the influence of the current. One sponge should be applied to the sacrum, the other successively to the spine, bowels, thighs, and the perineum, or fork of the thighs. The galvanic current should be used with great care, as much harm may be done by the employment of too strong a current, or by the application of even a mild current for too great a length of time.

Medicinal Remedies.—In many cases, emissions occur less as the result of an immediate or exciting cause, than from the influence of a morbid habit which has been established in the system. Any means which will interrupt the habitual occurrence of the emissions, which is sometimes so regular as to be almost periodical, is a useful means of treatment, even though its effects may be quite transient in character. The habit once

broken, the disease is more easily controlled. There are certain drugs which possess the property of lessening nervous irritability or benumbing the nervous sensibility, and have a special controlling influence over this disease. Among the most useful drugs of this class are the bromides. These may sometimes be used for temporary effect with great advantage. It should be borne in mind, however, that the bromides, as well as all other drugs, are capable of being abused, and that their continued use would be likely to result in harm, not only to the nervous system, but to the digestive organs. If resorted to, it should be only under the advice of a physician and for a brief length of time, as when long used, they are almost certain to produce serious disturbances of digestion. When used in large doses, the bromides often produce great disorder of the stomach, together with many nervous troubles.

The medicines sent out by the multitude of quacks who advertise to cure this malady, if not wholly fraudulent in character, usually consist chiefly of bromide of potash, which, by checking the emissions, induces the individual to believe that he is cured. In the vast majority of cases, however, the effect of the drug only lasts as long as the medicines are being taken, or at best but a short time afterward. The continued use of drugs of this class, advertised so liberally by charlatans, is invariably bad. Patients usually find themselves in a worse condition than at first, after spending a considerable amount of money for nostrums which at the very best could do very little good, and are pretty certain to do great harm.

Unfortunate indeed is the young man suffering with

this malady who falls into the hands of one of the many human sharks that abound in all our large cities, and are watching every opportunity to prey upon young men who may be led to seek them for advice. The first effort is to excite the mind of the patient to the highest degree of alarm respecting his condition, even causing him to imagine that his case is almost hopeless, where in many cases the existing disease is so trifling that the patient might with perfect propriety be recommended to forget it altogether. No young man suffering in this way should ever place his case in the hands of a physician whose character he does not know to be above reproach. It is far better to place confidence in the family physician than to consult one of these so-called "specialists," who are generally ignorant pretenders, skilled only in the arts of deception, and in ways and means of decoying victims into their money-taking net.

DIURNAL EMISSIONS.

Under the above head are included all forms of involuntary discharges, whether seminal or not, occurring in the day-time, with the exception of the discharge accompanying gonorrhœa, or gleet. In the healthy state, the urethra is subject to no discharge at all, except as the result of sexual excitement. In a state of disease, discharges occur which may or may not be attended by venereal excitement or sensation of any sort.

There has been much discussion respecting the significance and importance of these diurnal discharges. Some have undoubtedly exaggerated the importance of this symptom, especially when the discharge only

amounts to a very small quantity, as a drop or two of clear, transparent fluid, while others have perhaps underestimated its importance, expressing the opinion that the symptom is never of serious import, except as it gives rise to feelings of apprehension on the part of the patient. It is undoubtedly true that patients are often unnecessarily apprehensive, feeling uncalled-for alarm on noticing the presence of a slight discharge on going to stool, or after passing urine; but from extensive observations in cases of this sort, we are convinced that the real danger is to a large extent not understood by physicians who have not given the matter careful study, and that quite as much harm has been done by the failure of medical men to appreciate the necessity of making careful investigation of the facts whenever the patient complains of an abnormal discharge of this character, as from the overanxiety of those whose fears were greater than the circumstances of the case would justify.

Some may consider it absurd that the loss of so small a quantity of fluid of any kind whatever as is observed in many patients who suffer in this way, is an adequate cause to account for the numerous and serious symptoms of which such persons complain; and it may be concluded with justice that many of the distressing sensations and conditions which these sufferers mention are the result of a morbid imagination, and do not arise directly from the symptom referred to. Yet any physician who has had a large experience with this class of patients, must certainly admit, that however much there may be of diseased imagination in these cases, there is still much which

must be chargeable to morbid physical states. It may also be suggested that, in many cases at least, the long train of unpleasant symptoms which the patient experiences is not the result of the involuntary discharges, but that the latter symptom is with the rest the result of some underlying morbid physical condition to which all the symptoms are due, and is simply a local expression of the general disease. We have frequently observed in the history of these cases that the involuntary discharges did not appear until many of the other symptoms had been long present. Cases of this sort are usually those in which general nervous debility, arising from indigestion, excessive labor, either mental or muscular, with deficient sleep, intemperance, or other similar causes, is a permanent feature.

The important relation of these discharges to the general health of the body, is, however, sufficiently established by practical experience, which clearly demonstrates that the checking of such a discharge by the employment of either general or local measures, or both combined, usually results in an unmistakable gain in the patient's physical condition, and the removal of a great share of the distressing symptoms of which he complains. This fact justifies giving to this class of patients serious and careful attention, sufficient, at least, to determine the nature of the discharge from which they are suffering, and to secure the adoption of such means as will be most likely to result in the cessation of the abnormal discharge. This course would be at least commendable, even if it were demonstrated that the discharge itself was a matter of no consequence, since the mental

distress suffered by patients who consult a physician respecting a discharge of this character, is usually so great as to be itself a cause of serious danger to health, and to demand the employment of every proper means which may bring relief. The importance of setting such a patient's mind at rest by removing the symptom upon which his mental pertubation is based, is too well recognized by physicians experienced with this class of cases to need emphasis here.

The Character of the Discharge.—In order to understand the nature of these discharges, it is necessary to recollect the fact that the natural seminal discharge is a mucous fluid, composed of various secretions formed at several points along the seminal and urinary passages. *First*, we have spermatozoa, formed in the testicles; *secondly*, a mucous secretion, formed in the seminal vesicles; and *thirdly*, a clear, glairy, and somewhat viscid secretion, formed by the glands of the prostate. Diurnal emissions may consist of any one of these secretions, or of two or all combined. The amount may vary from a single drop to one or two drams. In the majority of cases, the discharges consist of one or two drops of a thick, viscid, or milky fluid, appearing at the end of the urethra after passing the urine, or during erections under strong sexual excitement. Not infrequently, however, in cases in which the sexual organs are very much weakened by abuse, the mere stimulus of erotic thought or any mechanical excitement whatever, is sufficient to produce the venereal orgasm, accompanied by the ejaculation of a considerable quantity of seminal fluid. The clear, viscid fluid mentioned above, is simply prostatic secretion. Microscopical examina-

tion will rarely if ever disclose the presence, in this form of discharge, of spermatozoa, the characteristic element of seminal fluid. The opaque discharge, even if the quantity is only one or two drops, may contain a larger or smaller proportion of spermatozoa. It usually consists chiefly of opaque mucus from the glands of the prostate, and is due to catarrh of this part.

The frequency of these discharges varies greatly in different cases, and at different times in the same individual. Sometimes they are noticed at intervals of several days or of several weeks, occurring only as the result of special provocation, as intense and prolonged, but ungratified sexual excitement, the exceedingly detrimental effects of which have been previously pointed out. In other cases, the discharges occur with greater frequency, daily, or even several times a day, and with little apparent cause, perhaps without the knowledge of the individual. Indeed, in some cases, discharges may occur with the urine, and wholly without the knowledge of the patient, and can only be brought to light by a careful microscopical examination of the urine by a competent person. We have met a number of instances of this sort in which the individual had been long suffering with great physical and mental debility, and had been treated by various physicians, some of eminence, without other results than temporary palliation of their distressing symptoms. On making a urinary examination, which has been with the author a routine practiced for many years, the real cause of the debility and suffering was discovered by the presence in the urine of great quantities of spermatozoa, though previously this cause had not been suspected.

The real nature of a urethral discharge cannot be determined by other means than a careful microscopical examination with a microscope of sufficient power, used by a person who is familiar with the normal and abnormal conditions of the secretions of the seminal and urinary passages. We have frequently found spermatozoa present in cases in which we thought the discharge to be simply a quantity of urethral mucus or prostatic secretion. It should be borne in mind that the quantity of the discharge is no proper criterion of the gravity of the conditions which may exist in connection with it. It is not the amount of fluid lost which occasions the damage to the system, but rather the reflex irritation arising from the morbid condition of the sexual organs, which makes such a discharge possible. There is always, in these cases, an irritable condition of the urethra, and in the worst cases, in which the discharge occurs unconsciously with the urine, a relaxed condition of the ejaculatory ducts. Through the spinal cord, this morbid irritability reflects a perverse influence upon the whole nervous system, and through it upon the entire body, producing excessive debility, and that general disorder of mind and body of which this class of sufferers furnish so many conspicuous examples. But we need not dwell further upon this point here, as it will be more fully elucidated in the treatment of the subject of spermatorrhœa.

Exciting Causes of Diurnal Emissions.—These discharges invariably occur, *first*, during sexual excitement; *secondly*, in connection with defecation, or movement of the bowels; *thirdly*, with micturition, or passage of the urine, or immediately after the bladder has been emptied.

In a healthy individual, one who has never been addicted to sexual excess of any sort, it is scarcely possible that mental influence alone would effect a sufficient degree of local excitement to produce the sexual orgasm, accompanied by the seminal discharge; but persons who have injured the sexual organs by any form of excess, and particularly masturbators, have thereby weakened the nerve centers which control the operations of the body, and thus produced such a degree of local irritability that much less than the ordinary amount of excitement is required to produce the venereal crisis. These individuals often bring themselves into such a state that even the thought of the sexual act is sufficient to produce ejaculation. Sometimes, indeed, those who have abandoned themselves to the gratification of their passions, having discovered the readiness with which the venereal excitement may be produced by lascivious thoughts, give themselves up to what may be called "mental masturbation," by which they are ultimately reduced to the lowest possible state of physical and mental degradation. At first, the seminal discharge is accompanied by an erection; but after a time, the erections grow more and more feeble in character until there is no erection, nor indeed other than a very slight degree of sensation. Ultimately, in fact, the sensation ceases to be in any degree pleasurable, becoming only a slight burning, or of a decidedly painful character. Some of these victims of lust become at last reduced to such a state that the mere sight of a passing female or a painting or bust of a female figure will produce ejaculation, though not accompanied by either erection or sensation. In some cases, discharges occur several times a day, keeping the individual in a

wretched state of mind and body by the terribly exhausting drain upon his vital forces.

The author has met a few cases in which the ejaculation resulted not from the excitement of sexual thoughts, but from some physical or mechanical cause. From personal observation, we should say that in cases in which seminal discharges are produced by the causes named, the individual has usually been addicted to some form of sexual vice. In fact, it hardly seems possible that ejaculations should be produced by such slight causes, unless the organs have been previously weakened by abuse. In cases in which there have been great sexual excesses, the organs sometimes become so weakened that ejaculations may result from so slight a degree of mechanical excitement as the jolting of riding over a pavement in a wagon, or even the jarring of a railway car.

The discharge which occurs in connection with defecation is usually the result of constipation of the bowels. The exertion required to expel a large, dry stool, or the pressure of the fæces upon the seminal vesicles, squeezes out a few drops of viscid fluid, which may or may not contain spermatozoa. That spermatozoa are generally present in the seminal vesicles is rendered probable by the results of numerous examinations made and reported by competent observers, though the use of the seminal vesicles as a reservoir for seminal fluid is questioned by some modern authorities. The truth probably is that these sack-like structures serve the double purpose of receiving and retaining the spermatozoa, and forming a secretion which acts as a vehicle for them. It is probable that spermatozoa are sometimes

present and sometimes absent from the seminal vesicles, according to the degree of activity of the testicles.

Usually, the discharge occurring at stool is entirely without sensation; but it is sometimes accompanied by a slight burning or a peculiar sensation, somewhat approaching in character, though different from, that accompanying normal ejaculation. We have met a single instance in which the regular seminal ejaculation occurred in connection with defecation. In this case, it was due to a high degree of intestinal irritation, accompanied by a strong desire to relieve the bowels, which force of circumstances made it necessary to restrain by a powerful effort of the will.

Diurnal emissions are probably most frequent in connection with the passage of urine. The discharge may occur either before or after the escape of the urine, or it may be mixed with the urine. In order to discover the relation of the discharge to the urinary act, it is the author's custom to instruct the patient to obtain three specimens of urine in separate bottles. The first should consist of the first two ounces passed, the second, of an equal quantity of the middle portion, and the third, of the very last portion of the urine expelled from the bladder.

When spermatozoa are found only in the first urine passed, the indication is either that a few spermatozoa had been left in the urethra after a nocturnal emission or normal coitus, or that a small quantity had found its way from the ejaculatory ducts into the urethra, probably the result of a relaxed condition of the orifices of these ducts.

When spermatozoa are found in the last portion of urine expelled from the bladder, probably they will have

been pressed out of the vesiculæ seminales, or the ejaculatory ducts, by the concluding efforts of expulsion.

Spermatozoa found in the middle portion of the urine, indicate that a discharge of seminal fluid has taken place into the bladder. This symptom signifies a very grave state of affairs. It is often the result of interrupting the ejaculation after it has begun, by compression of the penis, so that the seminal fluid is prevented from being discharged. The normal outlet being obstructed, the semen is forced back into the bladder. Young men who are ignorant of the consequences, and who suppose the injuries resulting from seminal emissions and self-abuse are caused by the loss of seminal fluid, sometimes adopt this means of preventing the discharge, supposing that in so doing they are preventing the loss of semen, whereas they are simply delaying its discharge by forcing it back into the bladder. The great amount of harm resulting from this practice should be thoroughly understood. The practice of ligating the penis for the purpose of preventing nocturnal losses, should be also equally condemned.

Discharges connected with the first and last portions of urine usually appear as a few drops of opaque, and usually viscid fluid, squeezed out after the last portion of urine has passed. When the seminal fluid is passed back into the bladder, and mixed with the urine, its presence in the urine will not be indicated to the naked eye unless the quantity is very large, which is seldom the case. The whitish deposit which appears in the urine immediately after it is passed, or after it has been standing for some time in a vessel, almost always consists either of urates, phosphates, or mucus from the

bladder. The relative frequency of the occurrence of these three substances is in the order mentioned. The exact nature of the deposit cannot be determined without a careful microscopic examination, though if carefully applied, the following tests will often suffice :—

If a whitish deposit settles flat in the vessel, it is probably made up of phosphates or urates. If shreds of a whitish color float up into the urine above the deposit, it is undoubtedly composed, in part at least, of mucus. Urates and phosphates may usually be distinguished by the fact that urates only appear when the urine is cold, while the phosphates will be observed as soon as the urine has time to settle, and before cooling takes place. When present in considerable quantities, the phosphates often give to the urine a milky appearance when passed, which frequently leads to the supposition that large quantities of seminal fluid are escaping in this manner, whereas careful examination may show that the urine does not contain a single spermatozoon. When the deposit is composed of urates, it may be made to disappear entirely by simply reheating the urine. Phosphates will not disappear by heating, but are quickly dissolved by adding to the urine a quantity of strong vinegar or any acid.

Persons who have been addicted to sexual excesses, are often led to believe that their condition is even more serious than it is by the observation of these deposits in the urine. While we would not say anything that would comfort these individuals to such an extent as to encourage them to continue their abuses, a desire to present the subject in a fair light leads us to repeat what has already been said, that these deposits are very

rarely of a seminal character, and that it is only in the very rarest cases that spermatozoa are found in the urine in sufficient quantities to be apparent to the eye, except by the aid of a very powerful microscope.

Results of Diurnal Emissions.—Some of the consequences of these abnormal discharges have already been intimated. The results of their long continuance may be summarized as follows :—

1. General nervous exhaustion, accompanied by all the mental and nervous symptoms of sexual neurasthenia, or nervous debility, which have already been pointed out, and need not be repeated here. The patient is usually given to despondency, sometimes being driven almost to distraction by his mental suffering, a great share of which is undoubtedly the result of a morbid imagination, which has become diseased by allowing the mind to dwell upon the abnormal conditions, closely watching and exaggerating every symptom, and attributing every morbid sensation to the one symptom which he believes to be the foundation and cause of all his troubles.

2. Various disorders of digestion, which arise partly from a morbid mental state and partly from the physical exhaustion resulting from the constant drain upon the body. It is possible, also, that the reflex influence of the local irritation upon the nerve centers which preside over the digestive organs, may have something to do with producing the obstinate dyspepsia which is frequently found in these cases, and to which much of the physical debility may be fairly attributed, though usually charged entirely to the unnatural losses.

3. Various disorders of the bladder, particularly, frequent and painful or difficult urination. A very fre-

quent symptom is smarting at the beginning of the act, and a persistent dribbling, which continues for some time after the greater portion of the urine has been expelled from the bladder. The latter symptom is due to the relaxed condition of the muscles about the neck of the bladder, by reason of which they fail to contract promptly at the close of the act. This symptom is usually indicative of a similar condition of the muscles which guard the mouths of the ejaculatory ducts, by reason of which the seminal fluid is allowed to escape in a similar way whenever the vesiculæ seminales become overfull, a condition likely to be constant in these cases in consequence of the excited state of the testicles arising from erotic thoughts.

4. As the most constant of all the results of this morbid condition, must be mentioned the weakening of the sexual organs themselves. The functional ability of the sexual organs is confined within narrower limits than that of any other class of organs in the body. A frequent or continuous drain upon their vitality soon impairs their natural vigor, and weakens them, often to such an extent that perfect restoration to healthy activity becomes impossible. An individual who is subject to diurnal emissions is already well advanced on the road to complete impotence, and should place himself in the hands of a physician competent to deal with his case in such a manner as it may require. Cases of this sort, in which the discharge consists chiefly of seminal fluid, were once considered practically hopeless; but modern advances in the methods employed in treating this formidable form of sexual disease, give the skillful physician means of relief which afford a fair prospect of a cure, if properly and perseveringly employed.

Treatment.—The treatment of the graver forms of diurnal emissions, in which there is actual loss of seminal fluid, requires the personal attention of a physician skilled in the treatment of this class of maladies, and these cases cannot be considered proper subjects for home treatment. However, the observance of the principles laid down in this work, and the specific directions which are given, will do much to mitigate the symptoms arising from the disease, and to check its progress. The lighter forms of the malady, those in which the discharge consists of simply a prostatic fluid or mucus from the vesicles, may often be substantially relieved by the employment of such simple measures as can be used without the superintendence of a physician. The most essential of these measures are the following:—

1. The tepid sitz bath. This may be taken as directed for the treatment of nocturnal emissions.

2. The employment of such means as will secure proper activity of the bowels. A wet bandage worn at night, as elsewhere directed, the liberal use of fruits, the practice of kneading and percussing the bowels several times daily, careful attention to the moving of the bowels at a regular time each day, and if necessary, the use of the enema to soften the contents of the bowels, and secure a daily evacuation, are means which are to be particularly recommended. With reference to the last-named measure, the enema, it should be remarked, however, that its habitual use is to be condemned. It should be employed only when the bowels cannot be made to act without its use, or when the contents of the bowels are so hard and dry as to require great straining at stool, which should be carefully avoided in those cases in which discharges occur at stool.

3. In cases in which the discharge is due to disease of the prostatic portion of the urethra, it is usually accompanied by an irritable condition of the prostate gland. For the relief of this condition, the hot enema and other measures recommended in the treatment for "irritable prostate" should be employed.

4. The diet should be unstimulating, free from condiments and stimulating foods of all kinds. Tobacco, alcoholic liquors, and tea and coffee should be strictly avoided. An abundance of exercise should be taken daily, and the patient should avoid violent muscular exertion, such as jumping, etc. Horseback riding is also to be condemned when it produces local irritation or excitement, which is usually the case.

5. The mind should be kept free from lascivious thoughts. Without strict attention to this rule, all measures of treatment will be of little avail.

6. If any cause of local excitement exists, such as a long or tight prepuce, varicocele, anal fissure, or fistula, these causes should be removed by the necessary treatment or operation.

7. In cases in which there is distinct evidence of relaxation of the ejaculatory ducts, the proper application of electricity is a measure which often affords most excellent results. Faradic electricity, applied directly to the diseased parts, one pole being applied to the urethra, the other upon the lower portion of the spine over the bladder, at the perineum, the testicles, the inner side of the thighs, or upon each of these points successively, is very useful in restoring the lost tone of the organs, and contracting the relaxed ejaculatory ducts. In particular cases, the galvanic current is to be preferred to the

faradic, though a considerable degree of experience is necessary to discriminate between the conditions requiring the one or the other of these forms of electricity.

In the employment of galvanic electricity, only a very weak current should be used. The application may be either external or internal. If external, the positive pole should be placed upon the spine about six inches above the lower end, while the negative is placed successively upon the perineum, the spermatic cords, the testicles, and the penis, being retained about one-half minute in each position. The current should be strong enough to be perceptibly felt, but not painful. From fifteen to twenty cells are usually required for this purpose. When applied internally, the positive pole should be placed in the same position on the spine, while the negative is applied to a peculiarly constructed electrode placed in the urethra. The object of this application is to concentrate the current at the mouths of the ejaculatory ducts. This mode of application is likely to produce great harm, except in skillful hands, and should never be employed by the patient or by a novice. In obstinate cases, especially those in which there is loss of sensation in the organs, static or dynamic electricity may be properly employed.

8. We have found various astringent and other applications very useful in the treatment of this class of cases. As usually employed, they are of very little effect, however. We have found them most serviceable in connection with the endoscope, an instrument in which the whole urethra can be brought into view, and carefully examined under a strong light, and applications made directly to the diseased surfaces.

9. In cases in which the discharge is due to a relaxed condition of the ejaculatory ducts, sitz baths should be employed at a temperature of about seventy-five or eighty degrees, to be taken as directed elsewhere. The length of time occupied by the bath should be about ten or fifteen minutes. The cool enema is another excellent means of toning up the relaxed muscles. It should be taken daily, and the quantity should be about one-half pint. The psychrophore, or cooling sound, is also very useful in these cases. The cold spinal pour, employed by pouring cold water on the lower portion of the spine from a dipper, while the patient sits over a tub or some other convenient vessel, is an excellent means of stimulating the nerve centers so as to tone up the relaxed organs. After the pour, the spine should be rubbed thoroughly, to secure good reaction.

TRUE SPERMATORRHEA, OR SPERMORRHEA.

Under this head are included those cases in which the seminal discharge is not only involuntary in nocturnal emissions, but occurs unconsciously even in the day-time. Cases of this sort are among those referred to under the head of diurnal emissions, being the gravest class mentioned under that head. The extreme gravity of this class of cases renders it important that they should receive special attention in a separate chapter. Respecting the causes of true spermatorrhœa, or spermorrhœa, much more might be said than we shall have space to offer here, but the following observations we consider most important:—

1. The grave symptoms which accompany this disease

are not wholly due to it, but are frequently the result of some condition of which the spermorrhœa is also a symptom. The most active of constitutional causes are nervous exhaustion and general debility. It is frequently observed to make its first appearance in an individual who has previously suffered with no disease of this sort, during a convalescence after an attack of fever or during the insipient stages of tuberculous diseases or consumption, when the vital powers are somewhat enfeebled, though the sexual organs are still active. There is undoubtedly, in some persons, a constitutional tendency to this disease. It is quite possible that men who have suffered in this way themselves, transmit to their children a predisposition to the same malady. Certain it is that in some individuals very slight excesses will give rise to this affection, while others seem to be almost proof against it, indulging for many years, with apparent impunity, in excesses of the grossest character, although the penalty of their transgressions is certain to be inflicted in later years, in some of the most distressing forms of sexual disease.

2. It has been noticed that there is some relation between this disorder and epilepsy and insanity. An inquiry into the family history of persons suffering in this way will often reveal the fact that one or more near relatives have been affected with epilepsy, or some form of mental disease, and the individuals thus suffering are themselves not infrequently epileptic, or affected with some phase of mental disease, though usually in a mild form, and nearly all are of an exceedingly excitable temperament. In the early history of these cases, it will frequently be found that when very young, they were

afflicted with incontinence of urine, a disease due to an irritability the bladder and an abnormally excitable condition of the nerve centers controlling its action. In consequence of this state of the bladder, during sleep, when the restraining influence of the mind cannot be brought to bear upon the spinal centers which induce the bladder to contract, when full, and empty itself of its contents, these centers, being abnormally excitable, are induced to cause contraction of the bladder and expulsion of its contents before the organ becomes sufficiently full to provoke such an action of the controlling nerve centers in a healthy person.

On attaining puberty, when the sexual functions become active, and the seminal secretion first makes its appearance, this abnormal activity is transferred from the bladder to the sexual organs, resulting in nocturnal pollutions, which are substituted for the previous urinary discharge. This sort of substitution is particularly liable to occur in cases in which masturbation, or any other form of sexual abuse, has been indulged in, or if the sexual organs have been prematurely excited by erotic thoughts; but we have met cases in which the losses began to occur about the age of puberty, in which we could discover no evidence that any form of sexual abuse had ever existed. In these cases the disorder was probably due to a disordered condition of the general system.

3. Sexual excesses are undoubtedly by far the most common and powerful causes of this affection. These include not only marital excesses, but masturbation, "mental masturbation," and all forms of sexual vice. According to the statements of French veterinarians, stallions that are brought in contact with mares, but not

allowed to "cover" them, are frequently subject to this disease, which demonstrates the fact already hinted, that excitement of the genital organs, through allowing the mind to dwell upon sexual subjects, may produce the very worst results of sexual abuse.

How Sexual Abuse Produces Spermorrhœa.—During sexual excitement, the entire sexual organs are subject to the most intense congestion, during which the blood-vessels are enormously dilated, and subjected to a high degree of tension. If this overwhelming tension occurs frequently, the blood-vessels of the parts become relaxed so that they retain continually too large a quantity of blood. In other words, they become chronically congested. This condition results in the production of too large a quantity of seminal fluid, in consequence of which the seminal vesicles become overloaded, producing an unpleasant sensation and fullness in the parts, or erethism, which is usually accompanied by erections, calling attention to the parts and giving rise to erotic thoughts, which still further aggravates the difficulty. In the urethra, particularly the prostatic portion, which contains the orifices of the ejaculatory ducts, the mucous membrane becomes the seat of chronic congestion, which renders it abnormally sensitive. The urine, which normally does not affect the urethral membrane at all injuriously, causes smarting and burning of this sensitive portion; and thus whenever the bladder is relieved, an aggravation of the condition occurs. The long-continued irritation produces, ultimately, a semi-paralyzed condition of the muscles which close the orifices of the ejaculatory ducts, in consequence of which the seminal fluid is

allowed to escape whenever the erections occur, and without the ordinary ejaculatory act. In the worst conditions, the semen sometimes even dribbles away continually. As is the case with the nasal mucous membrane, and mucous membrane in other parts of the body, the long-continued congestion gives rise to thickening. In consequence, the urinary canal is lessened in caliber. At first, the thickening is simply a swelling, which is readily overcome by the force exerted in relieving the bladder; but after a time, the thickening becomes permanent, and then partial, or even complete stricture is produced.

The irritation sometimes extends to the seminal vessels, producing catarrh of these parts, and sometimes a gleety discharge, in consequence of which the seminal fluid becomes vitiated and diseased, even to such a degree as to produce sterility. The inflammation may even extend down into the testicles, producing disease of these organs, accompanied by neuralgiac pains, and often inflammatory processes followed by degenerations, in consequence of which the testicles gradually soften and waste away. The spermatic veins, particularly those of the left side, frequently become enormously enlarged, producing varicocele with its numerous inconveniences. The local irritation not infrequently extends up into the bladder, causing irritability of the bladder and often catarrh of this organ. In one case, at the *post mortem* examination of which the author was present in Bellevue Hospital in New York City, the irritation set up in this way had extended not only into the bladder, but through the ureters into the kidneys, finally resulting in death, after many years of horrible suffering.

But the changes produced in the genital and urinary organs are not the only results of excess, nor indeed are they the most important. The sexual organs are governed by nerve centers placed at the lower portion of the spinal cord. The secretion of semen by the testicles, and its discharge through erection and ejaculation, are under control of these nerve centers. Erections may occur as the result of the stimulation of these centers by the mind through erotic thoughts, or by reflex irritation arising from the organs themselves, or from contiguous parts, as in irritations of the rectum from piles, fissure, etc. The irritation resulting from the congestion caused by frequent sexual excitements, keeps the nerve centers in a state of constant activity, so that erections occur much more frequently than would otherwise be the case, and the testicles are stimulated to secrete an abnormal amount of seminal fluid, which, though increased in quantity, is greatly deteriorated in quality. The nerve centers themselves, being weakened by continual excitement and constant drain upon them, lose their normal tone; that is, they are brought into a condition in which they are unable to accumulate the proper amount of nervous energy, but are by very slight causes induced to spend the little nervous energy accumulated, in prolonged erections or even ejaculations. During sleep, the general nerve tone and the tone of the sexual centers is still lower than during wakefulness. It is on this account that seminal losses occur during sleep, from dreams, even though the same amount of sexual excitement would not produce erections when awake. The nerve tone gradually goes lower and lower, as the disease advances, until it

finally reaches a point at which ejaculation is allowed to occur during sleep from so slight a degree of excitement as that arising from fullness of the bladder, or the slight overheating of the spine from lying upon the back.

Only one step farther in the lowering of the nerve tone of the controlling nerve centers is required to produce involuntary discharges when awake. Still another advance, and the discharges occur with very feeble erections, and finally with no erection at all, and only a slight sensation. The seminal fluid, the most precious of all the secretions of the body, is now allowed to dribble away upon the slightest provocation, continually wasting the vital forces, and undermining the bodily powers until the man, once noble and intelligent, is reduced to a mere semblance of humanity, and is ruined, physically, mentally, and morally.

Of local causes, the most important are irritation of the bladder and urethra, which may be either primary, or the result of gonorrhœa, inflammation of the seminal vesicles, long and tight prepuce, accumulation of secretion about the glans, constipation of the bowels, and the condition known as varicocele, or enlargement of the spermatic veins.

Symptoms.—Among other symptoms of spermatorrhœa which have not been mentioned in the above description of morbid conditions, we enumerate the following:—

A dull aching in the lower part of the back, usually termed by patients "the small of the back," particularly in the morning, or after making muscular exertions, and always aggravated by seminal discharges; stiffness of

the limbs and want of muscular endurance; weakness of the knees, numbness, and strange sensations in the arms and legs; muscular twitching; pressure at the back of the head; numbness of the spine; numbness or abnormal irritability and sensitiveness in various parts of the body; dry and pasty skin; baldness; headache; loss of memory; dullness of apprehension; general loss of mental capacity, and incompetence to sustain any prolonged mental effort, particularly after the occurrence of an emission; shortness of breath; dizziness; blurring of the sight; noise in the ears, and temporary deafness; hesitancy and stuttering speech; constriction or oppression in the chest; heart-burn, sour stomach, feeling of weight at the stomach, constipation, and other symptoms of dyspepsia; great depression of spirits, sometimes even amounting to insanity, with a tendency to suicide; unsteadiness of gait; coldness in the extremities; wandering pains about the body; loss of confidence; palpitation of the heart; flushing of the face; emaciation; pain in the side; tenderness of the spine; loss of erectile power, resulting in impotence; coldness, numbness, or loss of natural sensation in the sexual organs; relaxed or shunken condition of the sexual organs; blueness of the organs; tenderness or dragging sensation in the testicles; pain in the spermatic cord or the groin; unnatural softness or tenderness of the testicles; smarting or burning on urinating; dribbling after urination; muscular twitching in the perineum, or fork of the thighs; unnatural excitability of the organs, as indicated by frequent, painful, or prolonged erections without erotic thoughts.

If an individual has inherited any tendency to in-

sanity, epilepsy, locomotor ataxia, or paralysis, he is pretty likely to lapse into some of these conditions. The ultimate results of spermatorrhœa are the most disastrous possible. It is true, the patient does not often die of the disease itself, but the terrible drain upon his vital powers develops some constitutional malady, or so weakens his vital capacity as to lay him open to the attack of some acute disease, by which his miserable existence is ended. Consumption is exceedingly common among these victims of sensuality. We have met a number of instances of consumption in which the disease was evidently the result of the weakening influence of spermatorrhœa. Insanity, epilepsy, dyspepsia, rheumatism, apoplexy, and nearly every disease, in fact, to which human flesh is heir, may occur as the secondary result of spermorrhœa.

Treatment.—The illustrious French physician, Lallemand, was the first to give to this disease the attention and thorough scientific investigation required to establish its treatment upon rational principles. His success attracted the attention of scientific physicians in every part of the world, and the interest excited in this malady, previously considered all but incurable, has developed means and methods of treatment which are efficient in the great majority of cases in restoring the patient to comfortable, if not perfect health. Many cases are susceptible of a perfect cure. These are those in which the malady has not existed for so great a length of time as to produce extensive degeneration of the parts. The most readily curable cases are those in which the disease is dependent upon some morbid physical condition which can be promptly removed, as a long or tight foreskin,

piles, or varicocele, which may be removed by the proper surgical treatment. Fortunately, these cases constitute quite a large proportion of the entire number of sufferers from this malady.

The cases which are the most difficult to cure, and in which a restoration to health is least likely to be complete, are those in which the disease is wholly the result of long-continued sexual excesses, particularly repeated self-abuse, and mental masturbation. When the practice has been continued long enough to produce great weakness of the sexual powers, and serious impairment of the general health, it is not probable that the sexual vigor can be perfectly restored, though the general health may be built up to such a degree as to render the patient able to engage in the ordinary duties of life. Indeed, the improvement in some of the worst of these cases is something remarkable when a thorough-going course of rational methods can be instituted and faithfully carried out. The greatest thing in the way of recovery is the inability of the patient to co-operate with the wise physician in his efforts to rescue him from the results of his evil practices. Failure to control the mind is one of the greatest impediments in the way of a cure. The patient should understand thoroughly that unless he can accomplish this, the most skillful treatment possible can do him no good. His recovery, if it is secured, will be largely the result of his own efforts. If his will-power is so weakened, and his self-control so destroyed, that he cannot purify his mind from lascivious thoughts, his case is a hopeless one. Some degree of improvement may be secured, but recovery is impossible.

The measures of treatment to be employed in the management of spermorrhœa are essentially the same as those enumerated for the relief of sexual nervous debility, nocturnal emissions, and diurnal emissions, the symptoms and morbid conditions of all three of these disorders being present in this disease. This being the case, we need not recapitulate what has been said respecting the treatment under the three heads mentioned, but will refer the reader to the sections named for directions respecting diet, exercise, baths, etc.

In some cases, it will be found that the discharges are provoked by irritability of the bladder, resulting from catarrh of this organ, or from rectal irritation arising from thread-worms. In these cases, the exciting causes must be removed by appropriate treatment. To remove thread-worms, adopt such measures as will keep the bowels loose and regular, and then inject into the bowels two or three quarts of a decoction of quassia chips, one-fourth pound to the gallon of water, first washing out the bowels by a large enema of warm water, together with a little castile soap.

Many years ago, an eminent French physician, Trousseau, invented what is called a prostatic compressor, which consists of a conical plug placed in the rectum in such a way as to compress the ejaculatory ducts, being held in position by a bandage. This prevents the escape of seminal fluid, and may be useful in some advanced and incurable cases, in preventing the constant escape of semen through the relaxed and open mouths of the seminal ducts; but in most cases it is as useless as it is unnecessary.

We must say one word respecting a method of cure

which has sometimes been resorted to by patients, and has occasionally been recommended by physicians. We refer to castration. The resort to this extreme means is in our opinion unjustifiable and unnecessary, although in a single instance we have known the best results to follow removal of the testicles. In this case, however, we have serious doubts whether the effect produced was not the result of mental influence more than of the change in physical condition produced by the mutilation.

Marriage.—Physicians are constantly asked by young men who are suffering from the results of self-abuse, May I marry? A large number of physicians, perhaps a majority, will have already anticipated this question by advising the patient to seek a wife as the best means of curing his malady. The amount of wretchedness, mental and physical, which has resulted from this random and hap-hazard advice, is too great to be estimated. The author has met scores of married men who have expressed the deepest regret that they had received and followed such advice. A young man who is suffering from sexual disease, wrongs both himself and another by entering the married state. Frequent seminal losses, as the result of masturbation or other sexual abuse, indicate a diseased condition which will only be aggravated by marriage. There is no curative virtue in the sexual act for one who is already suffering from the results of sexual excesses; and if it were so, what right has any physician to recommend a man to take a wife as he would make any other prescription? What right has a man to seek a wife as he would visit a druggist for a bottle of medicine? Let the young man, before he takes such advice from a physician, quietly

imagine himself in the place of the woman he may marry, acting simply the part of a medical prescription to a diseased man. We consider this advice absolutely immoral, and the young man who follows it is guilty of the grossest disregard of human rights. Any man who is suffering from the results of self-abuse, or any other sexual excess, has no right to marry until these results have been removed by proper treatment or a proper course of life. It is true that this cannot always be done to the fullest extent, but recovery should be at least sufficiently perfect to render marriage in no way harmful to the man, and to the woman not simply a prescription for a diseased husband.

Bad Medical Advice.—Not infrequently, when a young man seeks the advice of a physician for relief from nocturnal emissions or some other condition, on being advised to marry, demurs, and objects that he is not prepared to settle down in life, or that he is acquainted with no one whom he desires to marry. What advice does he then receive? Unfortunately, there are physicians who are so lost to all sense of propriety and purity and so reckless of the interests of their fellow-beings that they do not hesitate to advise such a young man to "keep a mistress," or even to visit houses of prostitution, taking pains to instruct them in all the particulars of their conduct in the practice of immorality. We do not hesitate to say that such men are a disgrace and a dishonor to a noble profession. Repeatedly, cases have come to our notice in which young men have been led to abandon themselves to a life of infamy by such advice, and we have met several cases in which the various forms of venereal disease, including that

most horrible of all maladies, syphilis, have been contracted by following the unwise counsel of such unprincipled physicians. No amount of professional advice can make immorality proper, even if it were known that real physical advantage might arise therefrom, the very opposite of which is wholly likely to be true.

DISEASES OF THE PROSTATE.

Acute Prostatitis, or Inflammation of the Prostate.—Acute prostatitis is usually the result of an extension of an inflammation of the urethra to this part, as in gonorrhœa. It is also sometimes caused by the application of strong injections into the urethra, or rudeness in passing sounds; by inflammation of the bladder; the use of alcoholic drinks, and excessive sexual excitement. Exposure of the perineum to cold and dampness, as in sitting upon the ground, is also a recognized cause.

Symptoms.—The first symptoms felt are weight and fullness about the perineum and rectum; slight pain or uneasiness at the neck of the bladder; frequent desire to pass water, which is accompanied by more or less pain, especially at the conclusion of the act. As the disease continues, all the symptoms increase. The pain, which is almost continuous, begins to be severe, and throbbing or shooting in character. There is a sense of great fullness in the part affected, and tenderness about all the tissues in the fork of the thighs. Pain in the back and loins also becomes prominent as a symptom. A sitting position is painful, and nearly all bodily movements aggravate the suffering. There is pain on moving the bowels, difficulty in passing the urine, and chilliness

followed by more or less fever. The fingers placed in the rectum come in contact with a large, hard bunch, the inflamed prostate gland, the vessels of which are felt to be throbbing.

This disease usually terminates in a short time, leaving the organ enlarged, often permanently, though sometimes it gradually returns to its natural size. Not infrequently, the inflammation of the prostate becomes chronic, and continues for many months or even years. The disease is often accompanied by an acute attack of piles, between which and prostatitis, both acute and chronic, there is a close relation.

Treatment.—The patient should go to bed, and remain in a horizontal position most of the time during the attack. Cool water should be injected into the rectum, and retained until warmed, which will be in ten or fifteen minutes, and should then be replaced by a fresh supply of cold water. Cold applications may also be made to the perineum. A hot sitz bath should be taken once or twice a day. Once in two hours, the cold applications should be replaced by hot fomentations for half an hour; after the inflammation has subsided, poultices of starch, flaxseed, or any other non-irritating emollient, should be applied continuously. If the urine is retained, an effort should be made to pass it while taking a sitz bath, which will generally be successful. If the bladder is not relieved quite promptly in this way, a physician should be employed to pass a catheter.

A person who is suffering from this disease, is very likely to relapse, particularly if he indulges the passions, or allows the mind to dwell upon erotic thoughts. After recovery occurs, the prostate is found considerably en-

larged, and the force of the stream of urine is considerably lessened in consequence of the obstruction due to the enlarged prostate.

Chronic Inflammation of the Prostate.—In this disease, there may be or may not be enlargement of the prostate. There is always, however, a greater or less degree of irritability, which is accompanied by a discharge; difficulty in passing the urine; cloudiness of the urine; weight and dull pain in the perineum and about the rectum; pain in passing water, and in the sexual orgasm. Not infrequently, nocturnal emissions or diurnal emissions occur. Irritability of the bladder is also a prominent symptom. All these symptoms are aggravated by excessive muscular exercise, and errors in diet, particularly the use of stimulating foods, as condiments and an excessive quantity of meat. Alcoholic liquors and the use of tobacco are also highly injurious.

Treatment.—When slight, this condition is often overlooked by the patient, and perhaps does not seriously demand treatment, though when accompanied by nocturnal or diurnal emissions, or serious obstruction of the urinary passages, this disease should be taken in hand without delay, and treated with persevering thoroughness. The most effective methods of treatment are those which have already been recommended for acute prostatitis, though complete rest need not be enforced. The digestive organs must be kept in good condition. The stools should not be allowed to become hard and dry. All proper means should be taken to improve the general health of the patient, as thereby the advance of the disease may be stayed, and much may be done to ameliorate the unpleasant symptoms which it occasions.

When enlargement exists, this condition should be treated as directed in the following section.

Enlargement of the Prostate.—This condition is one which is frequently found present in persons of advanced age, even though no previous acute or chronic inflammation has existed. It is not a necessary accompaniment of old age, however, as cases have frequently been observed in which it did not exist in individuals who were upwards of a hundred years of age. Probably about one-third of all men above the age of fifty have prostates more or less enlarged. Any degree of enlargement may exist as from a size slightly larger than that of health to a diameter of three or four inches and a weight of nearly half a pound. Enlargement of this kind as the result of old age, seldom occurs before the age of sixty.

Symptoms.—A considerable degree of enlargement of the prostate may take place without any symptoms whatever. The first symptom which usually attracts the patient's attention, is diminished force in expelling the urine, which is soon followed by a sense of obstruction when performing the urinary act. The size of the stream may be nearly or quite that of health, but it is very weak in force. There is a frequent desire to urinate, which often occasions serious disturbance of sleep. Among other symptoms are weight, fullness, and uneasiness in the perineum and rectum, straining efforts required in passing water, producing irritation and discomfort of the rectum.

If the disease continues, cystitis, or inflammation of the bladder, sometimes results. Frequent and sometimes painful erections occur. The testicles become ten-

der and swollen. The bladder is not fully emptied, and the urine sometimes gradually accumulates in it, partially leaking out during sleep, when the voluntary control is suspended. There may be a constant overflow of urine from the bladder, which is likely, if not carefully watched, to become enormously and injuriously distended. To prevent such an accident, careful and frequent examination should be made of the lower part of the bowels just above the pubic bone. In a case which came under our observation some time ago, the attending physician had failed to recognize the existing semi-paralyzed condition of the bladder, and the almost complete urethral obstruction produced by the greatly enlarged prostate gland; and on examination we found the bladder was greatly distended, with the upper portion reaching nearly to the umbilicus. The introduction of the catheter gave instantaneous relief from great suffering, which had been endured for several days.

Very frequently, straining efforts made by the patient occasion the passage of a quantity of blood. The passage of blood is very likely to occur after exposure to cold or sexual excitement. Examination of the urine usually shows a considerable quantity of mucus. The urine usually has a strong ammoniacal odor, due to its retention in the bladder until decomposition takes place. The general disorder of the bladder and urinary organs sometimes gives rise to calculus, or stone in the bladder.

The presence of an enlarged prostate can always be determined by examination of the rectum with the fingers pressed against the anterior wall, when the enlarged prostate may be very easily felt. In occasional

instances, it will be found to be tender, though in many cases it is not abnormally sensitive.

Treatment.—The treatment of enlarged prostate unfortunately affords very little encouragement of a radical cure. All sorts of remedies have been employed for the purpose of producing absorption in the enlarged part, but with little avail. The most valuable means which can be employed in these cases, are revulsive applications to the perineum, and the local application of electricity. The first means of treatment consists in alternate hot and cold applications to the perineum. The extremes should be as great as can be tolerated. This treatment should be varied by the alternate hot and cold pour to the lower portion of the spine. In the application of electricity, the faradic current should be employed, the positive electrode being placed at the lower end of the spine, and the negative in the rectum.

While little can be done toward effecting a radical cure, much can be done to mitigate the symptoms of the disease, and delay its progress. If the bladder is incompletely emptied by its own efforts, the patient should learn to use the catheter, habitually washing out the bladder daily with a weak solution of salt and water at a temperature as warm as can be borne comfortably. What is known as the prostatic catheter should be used for this purpose, instead of the ordinary metallic catheter, which has not a proper curve to pass into the bladder without occasioning considerable pain and inconvenience. It has been claimed that the tendency to increasing obstruction of the canal may be antagonized by grasping the end of the penis after the stream of urine has started, closing the end of the urethra tightly while

continuing to endeavor to force urine out, thereby filling the urethra, and distending its walls to the utmost. This remedy may be serviceable in many cases, and worth the trial, but discretion should be used, as it is possible to do much harm by violent straining efforts. The frequent employment of sitz baths at a temperature of ninety-five degrees, is very often a means of great relief, and not infrequently urine can be passed in a sitz bath with perfect ease, though at other times the obstruction is complete.

Irritable Prostate.—A condition of the prostate in which it is sensitive to pressure may be the result of chronic or acute inflammation, but most frequently comes from sexual excesses of some sort, particularly masturbation and marital excesses. In cases of spermatorrhœa and all forms of involuntary seminal disorders, it plays an important part in the maintenance of the disorder by producing an abnormal degree of excitability of the parts. It is one of the first things which should receive attention in the treatment of this class of cases. Persons suffering from this condition, complain of smarting after passing the urine, and sometimes notice a heaviness or fullness about the fork of the thighs.

Treatment.—Frequent warm sitz baths, fomentations to the perineum, hot and cold applications to the lower part of the spine, and similar methods, are usually effective in allaying the irritation, provided the most active causes, sexual indulgence and excitement, are abstained from entirely.

Prostatorrhœa, or Prostatic Catarrh.—The characteristic feature of this disease is a clear, viscid fluid which escapes from the urethra, especially after an erec-

tion has occurred, and on urination. The discharge is the result of catarrhal disease of the glands of the prostate body. This affection is most often the result of masturbation. It may also be occasioned by sexual excesses of any sort, by the inflammation of gonorrhœa, and by exposure to cold, resulting in acute prostatitis, which leaves behind it this abnormal discharge. These discharges are very commonly supposed to be seminal in character, and give rise to much unnecessary apprehension on the part of the patient. It should not be supposed, however, that the discharge is not significant, or a condition which does not demand serious attention.

Treatment.—The treatment required for these cases is essentially the same as that recommended for chronic inflammation of the prostate gland. A tight prepuce bears an important relation to this disease. It is distinctly aggravated by stimulants of all sorts,—tobacco, coffee, and irritating condiments, such as pepper, pepper-sauce, cayenne, etc.

STRICTURE.

By this term is known any narrowing of the urethral canal produced either by spasmodic contraction of the muscles of the urethra, by the congestion and swelling produced by acute inflammation, or by the cicatricial contraction resulting from inflammation of the mucous membrane of the tissues lying adjacent to it. Stricture arising from the first and second causes named is always temporary, disappearing as soon as the cause of the spasm or inflammation is removed. Obstruction of the urethral canal sometimes occurs as the result of swelling

of the prostate, but this cannot properly be termed stricture. The amount of stricture varies from a very slight narrowing of the urethral canal to such a degree of narrowing as to reduce the passage to a mere pin-hole. The amount of contraction generally depends upon the length of time the disease has existed, as the tendency of this disorder is to increase.

The most common seat of stricture is the back part of the canal, just in front of the membranous or prostatic portion of the organ, that part known as "the bulb." The next most frequent seat is the external orifice of some part of the canal within two inches and a half from it. It occurs more rarely in the middle portion of the passage. The term *prostatic stricture* is probably a misnomer, and the result of imperfect observations, as a real stricture is never due to enlargement of the prostate, though this enlargement may by pressure occlude the canal, and render urination impossible.

Causes.—The most common cause of stricture is inflammation arising from some form of venereal disease, usually gonorrhœa, or clap. The inflammation which is the cause of stricture is also occasionally the result of injury, as from blows upon the perineum which bruise or lacerate the urethra. Inflammation is sometimes excited by the improper use of surgical instruments in the urethra. Strictures produced by mechanical injuries of this sort, are the most difficult of all forms to cure. Stricture does not usually appear immediately after the occurrence of the inflammation by which it is caused, but is the result of a gradual contraction of the canal following the inflammation, which may be going on for several years without causing sufficient narrowing to call attention to it.

In some instances, the external orifice of the urethra may be naturally too narrow. This difficulty is said to be quite frequent among the Jews. It is not congenital with them, however, but is said to arise from the irritation caused by exposure of the glans after circumcision. This fact affords a serious objection to the indiscriminate employment of circumcision, which has been recommended by some as a preventive of venereal disorders.

Another cause of stricture, usually slight, but distinct in character, is masturbation. Stricture arising from this cause is due to congestion and great irritability of the canal set up by the practice. It begins as a spasmodic contraction of the urethra, which, if persistent, will soon become a permanent or organic contraction, similar in character to that produced by actual inflammation. Stricture from this cause is generally located at the back part of the urethra, though it may be found at the anterior extremity.

Symptoms.—The early symptoms of stricture are a slight discharge, pain behind the seat of stricture at the time of urinating, frequent urination, and change in the form of the stream, which may be twisted, divided, forked, or squirting. These changes in the form of the stream may be due to swelling of the internal orifice, and not to stricture, and hence do not always signify the latter condition. The act of urination is unnecessarily prolonged, and as the stricture increases, it becomes more frequent. Great straining is required in urinating, which often results in protrusion of the rectum, and pain in the testicles, back, and lower portion of the abdomen. In some cases, retention of the urine is the most prominent symp-

tom. The urine usually undergoes putrefactive changes, a portion being retained in the bladder, and the bladder becomes congested, producing a catarrhal discharge, which appears in the urine as a whitish, tenacious deposit. A film is usually found on the surface, due to the presence of phosphates. Blood is sometimes passed with the urine, particularly when the catheter is frequently employed. Finally, the stricture becomes so tight that the urine is passed only in drops. After a time, a constant dribbling occurs, due to inability of the patient to empty the bladder, which becomes filled and constantly overflows. The bladder is often found greatly distended by urine; and the violent efforts to empty it sometimes result in rupture of the urethra, which may extend from the perineum to the scrotum, and even to the tissues above the pubis. Great impairment of the general health usually accompanies stricture, as loss of flesh, and disorders of the digestive organs, pain in the back and loins, and frequent attacks of chilliness preceded by fever, which usually are the result of the use of the catheter. These attacks are known as urethral fever. An attack of urethral fever may be induced by very slight causes, as unskillful passage of the sound, or using an instrument a little larger than usual. In some very susceptible cases, the most careful use of the catheter will produce urethral fever. It is also often caused by strong injections.

Treatment.—The proper treatment of stricture is removal by dilatation or division. Various methods are adopted to meet the requirements of individual cases, and a great variety of instruments have been devised for this purpose. It is unnecessary to enter into a descrip-

tion of them, however, as these cases should be undertaken only by a skillful physician, and one who has had experience in their management.

PHIMOSIS.

A narrowing of the prepuce, or foreskin, so that it cannot be turned back over the glans penis, is known as *phimosis*. This condition may be congenital, or it may be the result of chronic inflammation or irritation. When the prepuce is too long, so that the secretions are retained, irritation is very likely to arise, which may ultimately result in contraction to such a degree as to almost entirely close the orifice, producing real stricture. The inflammation may be sufficiently intense to cause adhesion of the foreskin to the glans. The author has met several of these cases in men who were quite advanced in years. In one case, neglect on the part of the patient, or rather a refusal to submit to the proper treatment, resulted in death from disease of the bladder, induced by retention of the urine, and the violent efforts required to force it through the narrow opening. Besides the retention and bladder irritation which frequently result from this condition when the orifice becomes considerably narrowed, various reflex effects upon the muscular system are attributable to this condition, as partial paralysis of certain parts of the body, particularly the lower extremities. Hysteria, hypochondria, nocturnal pollutions, and even spermatorrhœa, are also attributable to this cause. Sometimes the severe straining required, produces rupture, or hernia. This result is most likely to occur in cases of congenital phimosis.

Treatment.—If the contraction is not so great as to render it impossible, draw the foreskin back over the glans, and carefully cleanse the parts with a little soap and water, after which apply a little olive-oil at first while the parts are sensitive. Retain the foreskin retracted behind the glans for a short time, and then return it. When very tight, the retention of the foreskin behind the glans for a great length of time might result in swelling so that it could not be returned, a condition which is known as *paraphimosis*. This procedure should be employed daily, and gradually the foreskin will be stretched until it can be retained behind the glans without danger a considerable portion of the time, and the difficulty will be overcome.

In cases in which the orifice is a little more contracted, relief may be obtained by forcibly stretching it with an instrument made for the purpose. This may be done so gradually that little or no pain will be experienced.

Circumcision.—When the contraction is so great that the orifice is scarcely larger than the urethra, circumcision or a similar operation will be required. Circumcision consists in cutting off a portion of the foreskin, or prepuce. In performing the operation, the foreskin is grasped, and drawn out as much as possible, and then cut off close to the glans. The mucous membrane is then divided, and attached to the skin by stitches. This operation is by no means necessary in all cases. In the majority of cases, simple division of the foreskin, as shown in Fig. 3, PLATE E, is all the operation required. A few stitches are placed in such a way as to retain the edges of the mucous membrane and the skin together,

and healing takes place in three or four days. We have performed this operation many times with most satisfactory results, and consider it preferable to the ordinary method of circumcision. The operation, of course, will be attempted by no one but a competent physician. We have sometimes employed for division of the foreskin a gum-elastic ligature. By means of a needle, a piece of elastic cord is passed under the foreskin, penetrating the skin at a point just behind the glans on the upper side of the penis. The two ends of the cord are then tied, considerable traction being made. The continued pressure of the elastic cord causes absorption to take place; and in the course of a few days, the skin will be cut through with very little pain, and without the loss of a drop of blood. This method is of course more suitable for use in cases of the disease in young boys in whom the skin and membrane are thin and delicate.

PARAPHIMOSIS.

In this condition, the glans is strangulated by means of the tightness of the foreskin, which is drawn back behind it. It may be the result of inflammation or swelling of the foreskin from chanchroid, or gonorrhœa. Persons suffering with tight prepuce should be careful not to leave it behind the glans sufficiently long to allow swelling to occur, as by so doing the swelling may become so great that it cannot be returned. In severe cases, quite an inflammation may occur, and also destruction of the parts by sloughing.

Treatment.—The swelling of the parts should be first removed by treatment, as by applications of ice, or

cloths wrung out of ice-water, or by a stream of cold water poured upon the parts. When the swelling is decreased as much as possible, which may be considered the case after employing the measures suggested for twenty or thirty minutes, an attempt should be made to bring the prepuce over the glans. To accomplish this, the penis should be grasped between the fore and middle fingers of each hand, the thumbs of the hands looking upward. Now bring the ends of the two thumbs against the glans, and carefully but steadily compress it in such a way as to force it through the constriction, and draw the foreskin forward. Failing in this, the following method should be resorted to :—

Wet a piece of linen two or three inches in width and six inches in length. Wrap around the penis in such a way that a portion protrudes in front. Now wind around the part an elastic cord, placing the cord first around the portion of linen projecting in front of the penis. Wind the cord evenly, as thread is wound upon a spool, and quite tightly, to produce a firm compression. It should be wound slowly, so as to allow the parts to contract. Gradually carry the winding over the entire swollen portion. After retaining it in position two or three minutes, rapidly remove, and if the swelling is not sufficiently reduced, apply the cord again before it has time to return. By so doing, the swelling can be gradually brought down until the prepuce may be readily restored by the fingers used in the manner already described. If the last method fails, a surgeon should be consulted, who will, if necessary, divide the foreskin at the point of constriction.

BALANITIS.

From neglect to cleanse the parts in cases of gonorrhœa, and in some instances from the irritation of the urine when the prepuce is long, the mucous membrane lining the foreskin and covering the glans sometimes becomes the seat of an acute inflammation, known as *balanitis*. This disease is liable to occur in persons who have a long and rather tight foreskin.

The symptoms are a severe itching or burning in the region of the glans, sometimes attended by erections and great sexual excitement. The foreskin is reddened and swollen, sometimes very greatly. A considerable amount of yellowish or whitish discharge occurs, which has a very disagreeable odor.

Treatment.—The most essential measure of treatment is simple cleanliness. The parts should be carefully cleansed with soft water, or a little soap may be added, after which a little linen or lint dipped in simply cold water or in lime-water may be placed between the foreskin and the glans. If there is much secretion, a solution of zinc, alum, or tannin, consisting of half a dram to the pint of water, should be applied to the affected surfaces each day, after careful cleansing, and the lint placed between the prepuce and the glans should be kept saturated with the same solution. If the foreskin is so tight that proper cleansing of the parts cannot be effected, the opening should be increased by stretching. This may be accomplished by means of a sponge tent,—a piece of sponge which has been dried under pressure, or by the use of an instrument for the purpose.

If the trouble is not relieved by the means suggested, a physician should be consulted.

Chronic inflammation of the foreskin frequently results in thickening and contraction, by which the orifice of the prepuce becomes very small, and the tissues acquire almost the consistency of gristle. In cases in which the trouble is intense, the prepuce becomes attached to the glans. These cases, of course, require a surgical operation.

HERPES OF THE FORESKIN.

This disease is characterized by the appearance of small blisters upon the mucous membrane of the foreskin. There is usually intense redness, considerable swelling, and much itching or burning.

Treatment.—The disease usually lasts but a few days, and a speedy cure may be effected by taking care to keep the parts thoroughly cleansed and protected from friction. A lotion of zinc or alum, three or four grains to the ounce, may be employed three or four times a day with advantage. Dry powders, as starch to which oxide of zinc or tannin has been added in proportion of one grain to the ounce, may often be used to better advantage than lotions.

VENEREAL WARTS.

The so-called venereal warts (Fig. 4, PLATE E) are warty growths, which occur upon the glans or the foreskin, the character of which, however, does not differ from that of warts appearing upon other parts of the body.

They are simply papillary growths, the characteristic appearance of which is due to the peculiarity of the tissues from which they grow. They are not really venereal in character, as they sometimes occur in persons who have never been exposed to any venereal disease. They usually come from the irritation resulting from an ichorous discharge, and are of course favored by discharges present in venereal diseases. They are, however, thought to be contagious.

Treatment.—These growths must be destroyed by the galvano-cautery, the hot iron, or strong caustics, as nitric acid, chromic acid, etc. They are very apt to return, sometimes requiring removal several times to render the cure perfect. After removal, the parts should be kept dry, and free from irritating discharges.

INFLAMMATION OF THE TESTICLE, OR ORCHITIS.

Inflammation of the entire testicle is comparatively a rare disease, though its occurrence is sufficiently frequent to deserve mention here. The inflammation may be either acute, chronic, or scrofulous. We shall give attention to the first only of these three forms of disease.

Acute inflammation of the testicle may result from a blow or a cold, though it most frequently occurs in cases of mumps, particularly about the conclusion of the disease. It occurs about twice in every hundred cases of mumps. It most frequently appears in boys who are about the age of puberty. The whole testicle may be involved, or only that part known as the *epididymis*. Recovery usually occurs without injury

to the organ, except that it is liable to subsequent attacks, though quite frequently the inflammation is followed by atrophy, or shrinking of the testicle.

Epididymitis.—A disease known as epididymitis, or inflammation of the epididymis, so closely resembles inflammation of the testicle that it is not likely to be distinguished from the latter; and as the two diseases are treated in the same manner, they will be considered together. This disease is much more serious in character, as permanent damage may be done by obstruction of the seminal ducts, which pass through the epididymis. The occurrence of this disease in both testicles is likely to result in sterility through obstruction of the seminal ducts.

Symptoms.—The chief symptom of inflammation of the testicle is swelling of the parts, accompanied by pain. This symptom is sometimes preceded by pain in the groin, which may extend to the perineum, buttocks, and front of the thighs. The testicle is tender as well as swollen, the tenderness often extending into the groin. The pain is of a peculiar sickening character. Pain in the back is also a prominent symptom. After a time, the skin of the scrotum becomes red and tense, if the swelling continues. When the inflammation subsides, some tenderness and considerable swelling are usually left. This generally disappears in a few days, but sometimes the testicle remains enlarged and hardened. By proper treatment, however, these results are not likely to occur.

Treatment.—As soon as the patient discovers pain in the groin and tenderness along the spermatic cord, he should immediately go to bed, and remain there until

the pain and soreness have subsided. If this course is pursued, together with the treatment which will be directed, the disease may disappear in a few hours, though it is not impossible that it may continue several days. Imprudence at the start is likely to prolong the malady for several weeks, and ultimately occasion the loss of the testicle. A hot pack, vapor bath, hot-air bath, or some other form of sweating bath, should be taken at the outset. The patient should be wrapped in woolen blankets after the bath, and carefully protected from chilling. As soon as active perspiration begins, the pain, which is sometimes quite severe, will usually subside.

The diet should be very light, consisting chiefly of fruits, grains, and milk. The bowels should be kept open by copious enemas daily. If necessary, a little salt or soap may be added to the water to secure thorough defecation. The testicle should be supported by means of a bandage constructed thus: Place around the waist a bandage about three or four inches in width. Fold a handkerchief cornerwise, so as to form a triangle. Make a sling of the handkerchief by attaching two of the corners to the waistband, and slip the sling over the testicles so as to hold them up. The sling can be prevented from slipping upward by fastening to the lower edge a piece of tape, and passing it between the buttocks, fastening to the waistband behind.

A still better method of supporting the testicles is by a pad shaped like a crutch, placed between the legs, and sufficiently high to support the testicles. The pad should be well cushioned. Hot fomentations, or linseed poultices, as hot as can be borne, should be applied to

the affected parts and the groin on the same side, for twenty minutes every two hours. On removing the fomentations, immediately apply cloths wrung out of ice-water, ice compresses, or ice packs. If compresses are used, the cloths should be changed every two minutes, or sufficiently often to prevent their becoming warm. Bags filled with ice-water are much better. They should be placed in such a way as to avoid pressure upon the testicle, but should envelop it well. It is necessary to have two or three, so that the fresh one can be placed in position while the other is being refilled with ice. The cold applications should be continued, except when the fomentations are applied, until the inflammation is subdued, which will be indicated by relief from pain, heat, tenderness, and swelling. After this has been accomplished, the absorption of the swelling between the coverings of the testicles may be hastened by continuous application of warm poultices.

If the disease continues several days, hot baths should be administered as often as every other day. The application of fomentations to the back will afford great relief from pain. The use of tobacco, opium, etc., in the poultices, is not necessary. If the treatment suggested is followed closely, the patient will suffer little pain, and the disease will be rapidly controlled.

HYDROCELE.

This affection consists of an accumulation of fluid between the coverings of the testicle. The fluid is not serum, as in dropsy, but consists of the natural secretion of the membrane greatly increased in quantity. The disease is usually the result of blows or mechanical inju-

ries of some sort, though it sometimes occurs without apparent cause. The amount of fluid rarely exceeds a pint and a half, and is generally much less, although one of the most eminent historians of modern times is said to have had a hydrocele which held six quarts. The disease frequently occurs in infants as well as adults.

Symptoms.—The difficulty is easily known by its peculiar appearance. (Fig. 6, PLATE E.) The swelling is generally pear-shaped, the large extremity downward, being very tense, and when viewed with a bright light on the opposite side from the eye, is semi-translucent, having the appearance of a bladder filled with water when viewed in the same way. An inexperienced person may confound hydrocele with hernia, or breach of the scrotum. It may be distinguished, however, by the fact that hernia is larger at the upper part, decreasing in size downward, and first begins next to the body, growing down; while the enlargement of the hydrocele begins at the lower part, increasing upward as the fluid accumulates. Hernia, unless strangulated, also disappears when the patient lies down; while hydrocele is unaffected by change of position.

Treatment.—The fluid may be very easily drawn off by simple puncture with a trochar. This treatment is all that is needed in small infants, as the fluid does not usually return; but in adults, it is very certain to refill. External applications have no curative advantages. A radical cure can only be effected by producing inflammation of the walls of the sack sufficient to cause it to adhere. This is readily done by the injection of a small quantity of tincture of iodine after the fluid has been removed. The remedy named is less likely to produce

violent inflammation than the various other irritants which are sometimes used for the same purpose. The operation of laying open by the knife, thus producing an open sore, is effective; but a cure by this method is attended with prolonged suffering, and hence should not be tried unless other methods have been used without success. A person suffering with this disorder should place himself in the hands of a good surgeon.

IRRITABLE AND NEURALGIAC TESTICLE.

Irritability and tenderness of the testicle is likely to occur about the period of puberty, when special development occurs. The tenderness is such that a slight touch or the friction of the clothing in walking produces pain. There is no swelling or appearance of inflammation. The difficulty is sometimes present in epilepsy; but it is usually the result of self-abuse or prolonged sexual excitement from lascivious thoughts. In these cases, pain frequently extends to the limbs and back, and is often attended with nausea and much distress. There is also occasional swelling of the testicle in cases of the latter class. The pain is sometimes so great, especially where the patient has been addicted to self-abuse, that he begs to have the organs removed.

Neuralgia of the testicle is due to the same causes which produce neuralgia in other parts of the body. It is very liable to occur in persons suffering from inactivity of the liver, and disorders of digestion, or constipation of the bowels, especially when the patient has been addicted to the habit of self-abuse or sexual excesses of any kind.

Treatment.—In young boys, the difficulty will usu-

ally be removed by the application of the wet compress at night. In some cases, hot fomentations to the parts, night and morning, and occasional sitz baths, will be required. Attention should be given to the general health by the regulation of the diet, exercise in the open air, etc.

Measures should be taken to discover the cause, which should be promptly removed. No good can come from treatment so long as the patient indulges in erotic thoughts, or while the bowels are constipated, or other active causes are in operation. Sitz baths should be taken daily. The testicles should be supported by a suspensory bandage. This is of particular advantage when a varicocele is present, which, even though slight, is often attended with a great amount of pain and discomfort. A sitz bath should be taken daily, or every other day, at a temperature of 105°. Instead of the sitz bath, the parts may be bathed with hot water morning and night, either by pouring water upon the parts from a dipper, or laving them in the water from a wash-bowl.

The diet should be unstimulating. Flesh food should be used very rarely, and condiments, tobacco, and stimulating drinks should be avoided. If the patient is plethoric, which is often the case, sweating baths should be taken once or twice a week, and a spare diet should be employed to reduce the flesh a little. The bowels should be kept open by an abundant use of fruits and coarse grains, or, if necessary, by the employment of enemas. The old plan of removing the testicles, practiced by some English surgeons, is unnecessary. Removal of the cause is a much more rational plan.

ATROPHY, OR SHRINKAGE OF THE TESTICLE.

Atrophy of the testicle, as indicated by a softening or diminution in size, is sometimes the result of inflammation, though it is much more frequently the result of masturbation or excessive venery. It never occurs as the result of abstinence from sexual indulgence. Softening or destruction of the organ is often the result of varicocele. It should be said that considerable softening may occur without entire destruction of the organs, or total loss of sexual power.

VARICOCELE.

Varicocele, or a varicose condition of the spermatic veins in the scrotum, is a very frequent affection, being found in about one of every ten adult males. The enlargement may be accompanied by a chronic inflammation, causing thickening of the walls. The mass of enlarged veins sometimes assumes so great size as to entirely conceal the testicle, causing the affected side to become several times larger than the other. The disease usually begins at about the age of eighteen or twenty. It is often unnoticed for some time, generally until the swelling becomes so great as to attract attention, when it is often mistaken for hernia. It may be distinguished from the latter condition by the peculiar feeling of the mass of veins, which produce, when pressed between the thumb and finger, the sensation of a mass of worms. (Fig. 2, PLATE E.) On lying down, it usually disappears. On arising, the veins begin to fill, and the swelling reappears, beginning first near the testicle. By this means

it can be distinguished from hernia, in which the enlargement begins above, at the body, increasing downward as the intestine protrudes more and more. Varicocele most frequently occurs in the left side, owing to the fact that there is no valve in the left spermatic vein.

Varicocele is usually accompanied by more or less pain and inconvenience. There is frequent pain, not only in the testicle, but in the groin. If not actual pain, there are constant dragging sensations, especially when engaged in active exercise on the feet, and particularly during hot weather, which render the patient very uncomfortable. There is also, frequently, pain in the back.

The most common causes are straining at stool from constipation of the bowels, and long walking or standing. It is most likely to occur in persons who have been addicted to the habit of self-abuse or sexual excesses of any sort.

Treatment.—Mild cases require simply suspension of the parts by means of a scrotal suspensory bandage, which consists of a proper sling or bag, supported by a waistband. There are many varieties of these supporters made, most of which are worthless. It is important that the support should be of such a character as to produce no discomfort; but it should at the same time be firm enough to afford sufficient compression to empty the dilated veins.

Cold bathing of the parts will do much to overcome the relaxation of the scrotum which is always found in these cases, and it will be found particularly useful in hot weather, when the parts are naturally more relaxed.

In bad cases, those in which the varicocele is very large, or in which the patient suffers great discomfort or

inconvenience from the pain, which is not removed by the scrotal supporter, and in cases in which wasting of the testicle is occurring in consequence of the disease, more radical measures should be employed. The only means of radical cure is a proper surgical operation. There are two classes of operations which have been employed. One consists in removal of an elliptical portion of the skin of the scrotum, by which the size of the scrotum is diminished, so that the veins are permanently compressed. This method is in many cases entirely satisfactory. It has the advantage of being wholly free from danger, either to the life of the patient or the integrity of the testicle. But it has the disadvantage that in many cases, especially those in which the varicocele is large, the remaining tissues of the scrotum are gradually stretched until the relaxation becomes nearly as great as before. The second method consists in obliteration of the diseased veins by ligation or otherwise. The common method of doing this involves some danger of inflammation of the veins and blood poisoning. We have for some years, however, adopted a method of ligating the veins with non-irritating ligatures, and have seen none but the best results. In cases in which there is great relaxation of the scrotum, both methods should be employed. The scrotum should be shortened, and a number of enlarged veins ligated.

PRIAPISM.

Very frequent or persistent erections are frequently the result of abnormal irritability of the controlling centers of the brain and spinal cord. This condition is known as *priapism*. It may result from injury to the back of the head. Lallemand relates the case of a patient who was able to produce not only erection, but ejaculations by simply striking his head with his knuckles. Extreme cases in which the erection is almost constant and painful, are much more rare than those in which the erections occur on slight provocation, as the friction of the trousers in walking or riding. Irritation of the prepuce, constipation of the bowels, and irritability of the spine, arising from any source, are among the most common causes of this condition. To this must be added the condition of irritable weakness of the organs, which is the common result of sexual excesses, especially self-abuse. There is commonly found in these cases an irritable condition of the prostate, and frequently of the whole urethra.

Treatment.—The cause must be removed. Exciting foods of every kind must be avoided. The mind must be kept free from every lascivious thought. A warm sitz bath may be taken with advantage daily, or even twice a day. Hot fomentations, applied over the lower portion of the spine, is a useful measure which will commonly afford relief. To these measures should be added all such as will improve the general health.

ABNORMALITIES OF THE TESTICLES.

The testicles are developed in the abdomen, usually descending into the scrotum a short period before birth. In occasional cases, one or both testicles do not descend into the scrotum at this time, but remain either permanently or for a short time in the abdominal cavity. This accounts for the fact that men sometimes have children who apparently have no testicles. It should be stated, however, that a man whose testicles are in this condition, is likely to be sterile. The sterility is not due to the abnormal position of the organ, but to the fact that a retained testicle is likely to be imperfectly developed. The author has met a few cases in which one testicle was sometimes in the scrotum and sometimes in the abdomen, the patient having the power to draw it up into the abdominal cavity at will. Occasional cases occur in which an extra or supernumerary testicle is found. In most cases, however, what appears to be a third testicle is but a cystic fibrous growth. The testicle is sometimes misplaced, and is occasionally found in the perineum. Nothing can be done to remedy the condition known as non-descent of the testicle, and in cases of supernumerary testicle, no treatment is required.

IMPOTENCE.

Impotence is usually the result of sexual excesses. Probably the most frequent cause is abnormal sexual indulgence, particularly self-abuse. When begun early in life, and continued to a greater or less extent while

the body is developing, and before the sexual organs are fully matured, a period during which this portion of the body should be wholly free from excitement, the sexual powers are almost certain to be more or less weakened, though in some individuals a great amount of indulgence seems to be tolerated without producing impotence.

The first symptoms usually noticed by an individual whose sexual powers are weakening, is too early ejaculation in the sexual act. As the disease advances, a partial loss of sexual power soon follows. The primary cause of this symptom, which ultimately leads to total loss of sexual power, is exhaustion of the nerve centers of the spinal cord, which control the sexual organs. This is the atonic form of impotence, which is by far the most common of all the forms of this humiliating disease. In this class of cases, there will usually be found a sensitive condition of the urethra. In nearly all cases, there is usually more or less tenderness of the prostatic portion of the urethra, and the urethra may frequently be found excruciatingly tender throughout its whole length. Cases occasionally occur in which the urethra is not sensitive. In these cases, there often seems to be a slightly paralyzed condition of the entire organs. Sometimes there is a numbness or lack of sensibility in the skin of the penis or scrotum, or of some other portion of the organs.

Impotence is sometimes only a symptom of other diseased conditions of the body. It is frequently an accompaniment of dyspepsia, various forms of paralysis, spinal irritation, diabetes, and Bright's disease of the kidneys. Disease of the testicles is productive of the most complete and hopeless of all forms of impotence.

Treatment.—There is no specific treatment for impotence, and the only general principle which can be laid down is that the immediate cause, whatever it may be, must be removed. If the local weakness is due to general debility or disease, the causative malady must of course receive immediate attention. In these cases, no local measures of treatment may be necessary, though usually a cure may be hastened by the employment of the proper local remedies. If the sexual weakness is due to an abnormal irritability of the urethra, this should receive such treatment as has been elsewhere indicated.

Cases of impotence arising from spermatorrhœa or general nervous debility, should be treated according to the directions given for the management of these disorders. Electricity is in these cases found to be of great value when properly applied. Both galvanic and faradic electricity are highly useful. Some cases, especially those accompanied by partial loss of sensation in the skin covering the organs, are found to be especially benefited by static electricity. The methods of applying galvanic and faradic electricity are the same as have been laid down in the treatment of nocturnal losses and spermatorrhœa. The electrical brush is frequently found to be a valuable addition to the methods of treatment already intimated. Fomentations, hot and cold applications, and the hot pour to the spine, are often found to be of very great service in cases of this sort. Alternate hot and cold sponging of the parts, especially when the patient complains of numbness and coldness of the organs, is a very useful measure.

We should not neglect to warn those who are suffer-

ing in this way of the danger which is likely to result from the use of the various aphrodisiacs which are so commonly recommended by physicians to persons whose sexual powers show evidence of failure. These artificial stimulants sometimes arouse the sexual organs to an abnormal activity for a brief time, but only to produce ultimately an exaggeration of the exhaustion and debility. When symptoms of loss of sexual power occur, the patient should understand that the sexual organs have become weakened, and demand rest, and he should abstain wholly from all excitement of the organs through mental influence or otherwise. In the majority of cases, a sufficiently prolonged rest will give the organs opportunity to recover their natural tone, especially if the measures of treatment above recommended are faithfully carried out. In some cases, however, the disease is so obstinate that it demands the best efforts of the most skillful physician. Those who seek medical advice for relief of this disease, should be careful to avoid the great army of quacks who set many traps and pit-falls for the unwary young man who believes himself to be threatened with a loss of sexual power, or impotence. These charlatans reap a rich harvest from the fears and easy gullibility of this class of patients.

It is unquestionably true that quite a large proportion of the cases who seek medical advice for the cure of impotence, are the result of mental influence. The patient, knowing that he has been guilty of excesses, imagines that he has become impotent, and thereby really makes himself so. These cases can be readily cured by proper medical advice. The fact that they exist should not lead physicians to consider that nearly

all cases are the result of this condition, as there are probably very few cases of so-called psychic impotence in which there is not real weakness of the sexual organs; and there is in the majority of cases a prostatic irritability which should be removed by proper treatment.

STERILITY.

This condition, while it is much less common in man than in woman, is undoubtedly much more frequent in the male sex than is generally supposed. It has been estimated by reliable authorities that in cases of sterility occurring in married couples, the fault is with the man in about one in six cases. The most common causes of sterility are the following: Non-development of the testicles; disease of the testes, as chronic inflammation, or the results of acute inflammation; absence of the testicles; deformity or obstruction of the vas deferens or some portion of the seminal ducts; diseased seminal fluid; catarrhal or bloody discharge, usually the result of disease of the vesiculæ seminales; too frequent sexual indulgences, causing deterioration of the seminal fluid which may exist even to the extent of the entire absence of spermatozoa; frequent seminal losses; prostatorrhœa, or catarrh of the prostate; aspermatism, or absence of spermatozoa; non-ejaculation; consumption; syphilis; disease of the brain and kidneys; neurasthenia, or general nervous debility.

Treatment.—The treatment of sterility requires a high degree of skill, and hence cases of this sort should only be undertaken by a physician of experience. The skillful physician will first seek to remove the causes of

the disease, when they are of such a character that they can be removed by remedial means.

CASTRATION.

The operation for the removal of the testicles is known as *castration*. This operation was practiced among Eastern nations in ancient times, especially in the households of kings, who required the officers employed in their households to submit to it,—a cruel custom, which fortunately is not in vogue at the present time. During the Dark Ages, young men who were employed as singers in the religious services of the cathedrals, were usually subjected to this operation for the purpose of preserving the high-keyed tone of their youthful voices. The effect of the operation, when performed before puberty, is to prevent those changes which naturally occur at that time. When performed after the body has attained maturity, the operation does not materially affect the individual's physical appearance, although certain mental changes, particularly the tendency to effeminacy, has sometimes been observed. It is possible, however, that the last-named effect is not a necessary result of the operation.

CIRCUMCISION.

This is an operation which has been practiced by the Jews from the earliest times, and has also been in vogue among several Eastern nations from time immemorial. This operation is usually performed by cutting off a portion of the foreskin, or prepuce. It is often neces-

sitated by a redundancy or tightness of the prepuce, though we do not approve of the assertion sometimes made by medical men that all males would be better for submitting to this operation. Observations made among the Jews have shown that circumcision occasions a narrowing of the external orifice of the urethra, in consequence of which some of the unpleasant results of stricture may be produced. This is due to the prolonged irritation present during the healing of the wound when performed upon young infants in the usual way.

General Hints about Health.

IN this short chapter, the reader will find a few important hints respecting the general care of the health, a subject which has not received special attention in other chapters in this work, but which is well worthy of the careful consideration of one who wishes to attain a high degree of physical vigor, and the full enjoyment of all his faculties and senses. The cultivation of health by attention to all the laws which govern the various activities of the body, is one of the most profitable occupations to which a portion of one's time can be devoted.

Care of the Skin.

The following remarks on this subject are quoted from a larger work by the author, entitled the "Home Hand-Book of Domestic Hygiene and Rational Medicine":—

The skin is one of the most important depurating organs of the whole body. From each of its millions of pores constantly flows a stream laden with the poisonous products of disintegration. As the water evaporates, it leaves behind it these non-volatile poisons, which are deposited as a thin film over the whole surface of the

skin. As each day passes, the process continues, and the film thickens. If the skin is moderately active, three or four days will suffice to form a layer which may be compared to a thin coating of varnish or sizing. The accumulation continues to increase, unless removed, and soon undergoes further processes of decomposition. It putrefies,—rots, in fact,—and develops an odor characteristic and quite too familiar, though anything but pleasant, being at once foul, putrid, fetid, pungent, uncleanly, and unpardonable.

But the offense to the nose is not the extent of the evil. The unclean accumulation chokes the mouths of millions of little sewers which should be engaged in eliminating these poisons, and thus obstructs their work. Being retained in contact with the skin, some poisons are absorbed, together with the results of advancing decay, thus re-poisoning the system, and necessitating their elimination a second time.

Here, water serves a most useful end, if properly employed. It is unexcelled as a detergent, and by frequent application to the skin, will keep it wholly free from the foul matters described. The necessity for frequent ablutions is well shown by the fact that nearly two pounds of poison-laden solution—the perspiration—are daily spread over the body. It is not an uncommon occurrence to meet with people who have never taken a general bath in their lives. Imagine, if possible, the condition of a man's skin, at the age of seventy or eighty years, which has never once felt the cleansing effects of a thorough bath!

How to Make the Skin Healthy.—A man who has a perfectly healthy skin, is almost certain to be healthy

in other respects. In no way can the health of the skin be preserved, but by frequent bathing. A daily or tri-weekly bath, accompanied by friction, will keep the skin clean, supple, and vigorous. There is no reason why the whole surface of the body should not be washed, as well as the face and hands. The addition of a little soap is necessary to remove the oily secretion from the skin.

A lady of fashion, in enumerating the means for preserving beauty, says: "Cleanliness, my last recipe (and which is applicable to all ages), is of most powerful efficacy. It maintains the limbs in their pliancy, the skin in its softness, the complexion in its luster, the eyes in their brightness, the teeth in their purity, and the constitution in its fairest vigor. To promote cleanliness, I can recommend nothing preferable to bathing. The frequent use of tepid baths is not more grateful to the sense than it is salutary to the health and to beauty. . . By such means, the women of the East render their skin softer than that of the tenderest babe in this climate." "I strongly recommend every lady to make a bath as indispensable an article in her house as a looking-glass."

When foul matters which ought to be eliminated by the skin and quickly removed from the body, are allowed to remain undisturbed, the skin becomes clogged and inactive, and soon loses its natural luster and color, becoming dead, dark, and unattractive. When bathing is so much neglected, it is no marvel that paints, powders, lotions, and cosmetics of all sorts are in such great demand. A daily bath, at the proper temperature, is the most agreeable and efficient of all cosmetics.

Bathing Protects against Colds.—It is an errone-

ous notion that bathing renders a person more liable "to take cold, by opening the pores." Colds are produced by disturbance of the circulation, not by opening or closing the pores of the skin. Frequent bathing increases the activity of the circulation in the skin, so that a person is far less subject to chilliness and to taking cold. An individual who takes a daily cool bath has almost perfect immunity from colds, and is little susceptible to changes of the temperature. Colds are sometimes taken after bathing, but this results from some neglect of the proper precautions necessary to prevent such an occurrence.

Aristocratic Vermin.—Doubtless, not a few of those very refined and fastidious people who spend many hours in the application of all sorts of lotions and other compounds to the face and hands, for the purpose of beautifying those parts of the person exposed to view, while neglecting as persistently the parts of the person not exposed to observation, would be very much surprised to learn the true condition of the unwashed portions of their cutaneous covering. They instinctively shrink with disgust from a vermin-covered beggar, in whose cuticle burrows the *acarus scabiei* (itch-mite), while troops of larger insects are racing through his locks and nibbling at his scalp. It is quite possible that many a fair "unwashed" would faint with fright if apprised of the fact that her own precious covering is the home of whole herds of horrid-looking parasites which so nearly resemble the itch-mite as to be at least a very near relative, perhaps half-brother or cousin. The name of this inhabitant of skins unwashed is as formidable as the aspect of the creature, though it does not require

a microscope to display its proportions, as does the latter; scientists call it *demodex folliculorum.*

The demodex makes himself at home in the sebaceous follicles, where he dwells with his family. Here the female lays her eggs, and rears her numerous family, undisturbed by the friction of any flesh-brush, and only suffering a transient deluge at long intervals, if such a casualty ever happens. In studying the structure of these little parasites, we have sometimes found several tenants occupying a single follicle, pursuing their domestic operations quite unmolested by any external disturbance.

The demodex has been transplanted from the human subject to the dog, and it is found that the new colony thrives very remarkably, and soon produces a disease apparently identical with that known as "mange."

We have not space to describe in detail these savage little brutes, with their eight legs, armed with sharp claws, bristling heads, sharp lancets for puncturing and burrowing into the skin, and their powerful suckers for drawing the blood of their victims. We care only to impress upon the mind of the reader the fact that neglect of bathing and friction of the skin is sure to encourage the presence of millions of these parasites, and that the only remedy is scrupulous cleanliness of the whole person. Like their relative, the itch-mite, they do not thrive under hydropathic treatment, and are very averse to soap and water. The best way to get rid of them is to drown them out. They do not produce the irritation which characterizes the presence of the itch insect, so that this evidence of their presence

is wanting. But they are likely to be present in a torpid, unhealthy, unwashed skin, no matter how delicate or fastidious its possessor.

Bathing a Natural Instinct.—All nature attests the importance of the bath. The rain is a natural shower bath in which all living things participate, and gain refreshment. Its invigorating influence is seen in the brighter appearance, more erect bearing, and brighter colors of the plants after a gentle rain. The flowers manifest their gratitude by exhaling in greater abundance their fragrant odors. Dumb animals do not neglect their morning bath. Who has not seen the robin skimming along the surface of the lake or stream, dipping its wings in the cool waters, and laving its plumage in the crystal drops that its flapping pinions send glittering into the air? No school-boy who has ever seen the elephant drink will forget how the huge beast improved the opportunity to treat himself to a shower bath, and perhaps the spectators as well, for he is very generous in his use of water.

If man's instincts were not rendered obtuse by the perverted habits of civilization, he would value the bath as highly, and employ it as freely, as some of his more humble fellow-creatures, whose instinctive impulses have remained more true to nature, because they have not possessed that degree of intelligence which would make it possible for them to become so grossly perverted as have the members of the human race. Man goes astray from nature, not because he is deficient in instinct, but because he stifles the promptings of his better nature for the purpose of gratifying his propensities.

CARE OF THE EYES.

Use of the Eyes.—The effort to accommodate the eye in looking at near objects, requires the action of several muscles, which must continue to act so long as the sight remains fixed on near objects. When the effort is long sustained, these muscles become weary, and when not given proper opportunities for rest, they may become seriously diseased. If the eyes are easily tired, and can be used but a short time without a blurring of vision or aching of the eyeballs, it is probable that there is some serious defect, and an oculist should be consulted.

Never try to read or do work requiring close application of the eyesight in a poor light. In doing so, the book or other object must be brought too near the eye, and thus near-sightedness may be acquired.

In reading, have the light come over the shoulder, the left if convenient, and avoid using the eyes in a glaring light as much as possible.

Never expose the eyes to a sudden bright light when it is possible to avoid doing so. After the eyes have been closed for some hours, some little time elapses after they are opened before they are fully accustomed to the light. On this account, it is not well to employ the eyes in reading immediately on waking in the morning.

Reading in the cars is injurious to the eyes on account of the shaking which continually changes the distance between the book and the eye, and thus taxes most severely the organs of accommodation.

Wearing Glasses.—When glasses are needed by old persons, they should be worn, not necessarily all the time in all cases, but when specially needed, as in read-

ing, doing fine work, etc. Persons who are near-sighted should avoid wearing too strong glasses, as this will increase the defect.

Glasses should enable a person to read with ease at eight to twelve inches from the eye. An old person who cannot see well without slipping his glasses down upon his nose, should obtain stronger glasses.

Eye Lotions.—The common use of the numerous domestic and patented eye-washes is a frequent cause of serious disease of the eye. When the eyes are simply irritated by excessive work, a cold, exposure to dust, or any similar cause of irritation, frequent bathing with tepid water, or rest with a thin cloth wet in tepid water laid over the eyes, is a good and harmless remedy. If the case is not speedily relieved by some simple measures of this sort, consult a competent physician at once.

Things in the Eye.—Dirt in the eye, if visible, may usually be removed by a corner of a folded handkerchief, or by the end of the finger previously moistened with oil. If out of sight under the lids, a loop of hair passed under and withdrawn will generally bring it out. A piece of steel or other sharp substance which has become imbedded in the eyeball, should never be left to work out, but a competent surgeon should be consulted at once.

If lime or any other alkali has gotten into the eye, bathe with water at once, and as quickly as possible apply a weak solution of vinegar, using about a tablespoonful of vinegar in half a glass of water.

Inflammation of the eye, if attended by great pain, intolerance of light, or a mattery discharge, demands the attention of a skillful physician.

Catching Eye Diseases.—All inflammations of the eye, attended by a discharge, are contagious by contact; and persons suffering in this way should never use the same wash-basin or towel used by others, and should sleep alone. Neglect of this rule sometimes allows a dangerous disease of the eye to extend through a whole school or institution.

Squint is an affection of the muscles of the eye. If the muscles which turn the eyes inward contract more strongly than the opposite muscles, the individual is "cross-eyed." If the outer muscles contract the more strongly, the eye turns out, and the individual is said to be "wall-eyed."

Wild Hairs.—Sometimes the eyelashes grow in a scattered manner, and turn inward toward the eyeball, causing great irritation. These are commonly called *wild hairs*. If persistently pulled out, they sometimes cease to grow, although the only certain cure is by a surgical operation.

Education of the Eye.—It is well known that savages and foresters generally possess much more acute vision than other persons, often being able to see clearly at long distances objects which are wholly invisible to others. This is undoubtedly the result of education; and it is quite certain that careful training of the eye in discerning objects at a distance would greatly increase its usefulness, and counteract the increasing tendency to short-sightedness which is becoming so marked among civilized nations as to excite considerable alarm.

HOW TO CARE FOR THE EARS.

Observe the following rules respecting the care of the ears :—

Never clean the ears with a pick or with the twisted end of a towel. The ear-wax dries up, and falls out of itself. Efforts to keep the ear free from wax, increase the difficulty by irritating the membrane, and causing it to make more wax.

Never allow cold water to enter the ears, and do not let a cold wind blow into them. If they must be exposed to cold air or to water, protect them by a little wad of cotton placed in the ear. Care should be taken to remove the cotton when it is no longer needed. Much mischief sometimes results by leaving portions of cotton or paper in the ear.

If a seed or other foreign substance has gotten into the ear, do not try to remove it by introducing a knitting-needle or by any similar means. The only safe plan is to syringe the ear with warm water, leaning the head to one side so that the object may drop out if loosened. If a pea or bean has been in the ear so long that it has swelled, and hence cannot be dislodged by the syringe, it may be contracted so that it will fall out by holding alcohol in the ear for a short time.

If an insect gets into the ear, pour in a little oil, which will suffocate it, when it may be removed by syringing.

Shouting into the ear may cause deafness. This is true of any loud or unexpected sound. Such sounds are liable to cause rupture of the drum head, which may be some time in healing, and may leave the hearing perma-

nently impaired. When a loud sound is expected, the ear is prepared for it by loosening of the drum head. It is also well to keep the mouth closed, and to cover the ears.

Earache may usually be allayed, if given early attention, by applying flannel cloths wrung out of water as hot as can be borne. This common complaint among children is often the result of a cold, and if it occurs frequently, may cause permanent deafness.

Partial deafness is much more common among children than is generally supposed, and a child should not be punished for inattention until its ears have been carefully tested by stopping each one in succession, and testing the other by speaking to the child at a distance while the eyes are covered. A person is often able to hear well when giving close attention; but when not expecting to be spoken to, will hear nothing.

Boxing and pulling the ears are barbarous practices, which often cause loss of hearing, and sometimes disease of the ear which proves fatal.

A cold in the head often causes partial loss of hearing for a few days, due to obstruction of the eustachian tube. If often repeated, permanent deafness may result.

Discharge from the ears is usually the result of an inflammation of the middle ear with rupture of the drum head. Such a case should never be neglected. Consult a physician at once.

Never put chloroform or laudanum in the ear for relief of toothache.

The use of tobacco in any form often leads to deafness by causing disease of the throat, which leads to ear disease. The same may be said of the use of liquors.

Tea and Coffee.—The wide-spread use of these popular beverages is undoubtedly responsible for much of the nervousness and a considerable share of the dyspepsia so common among civilized people. For many years, the use of these narcotics was considered harmless, by physicians as well as by the laity; but in recent years, many eminent physicians have become aroused to the fact that both tea and coffee are productive of much harm, and are protesting against their use. The active principle of both tea and coffee is a narcotic poison, a few grains of which will produce almost instant death when given to a cat or dog. Indeed, so small a quantity as twelve grains of this poison has been known to produce very dangerous symptoms in a strong man; and cases are on record in which persons have been made insensible by the drinking of strong tea.

Some years ago, a case was reported in which an English physician lost a fine horse through the carelessness of the groom, who allowed a small quantity of tea to become mixed with the grain which was fed the horse. The horse died with all the symptoms of narcotic poisoning. There is enough of this poison in a single ounce of tea to produce dangerous symptoms.

Coffee contains some less of the poison, but this does not diminish the harm arising from its use, as a larger quantity of coffee is usually employed than in the use of tea. In addition to this active principle, known as *theine* or *caffeine*, both tea and coffee contain *tannin*, which injures the stomach by contracting the blood-vessels, and otherwise impedes digestion by precipitating the pepsin of the gastric juice.

Persons who use tea and coffee are subject to nervous

trembling of the hands, headache, defective vision, and various other disturbances which indicate too clearly the poisonous character of these narcotics to leave any room for doubt respecting the propriety of their use. Both tea and coffee are particularly injurious to children, and wise parents, even though themselves wedded to their cups, will certainly withhold them from their children.

Drugs.—Great harm is done by the indiscriminate and wholesale use of drugs, which is so common at the present time. There are very few drugs which are not more or less poisonous in character, and the majority are deadly, except when taken in small doses. Those who use drugs should recollect that they are harmful, not only in large doses, but in small doses, when long continued. Quite a large proportion of common remedies, such as quinine, "blood purifiers" of all sorts, bromides, iodides, etc., are productive of much harm unless scientifically used. An immense amount of injury is done by the use of patent medicines, nearly all of which are composed of harmful ingredients, and which, so far as our observation goes, which is quite extensive, are capable of doing great mischief.

It is a favorable omen that the better class of physicians, especially those who have had the advantage of a course of medical study in European hospitals, where they have the opportunity to watch the practice and listen to the teachings of the highest medical authorities in the world, use drugs far less freely than formerly. More reliance is placed upon proper diet and attention to the general habits of life; to the removal of the causes of disease, rather than the mere mitigation of the symptoms. There is no question but that diseases have been

vastly multiplied by the multiplication of medicinal remedies. In a community where doctors are plenty, drug diseases are generally almost as numerous as disorders which arise from natural causes.

Rules for Dyspeptics.—A few years ago we formulated a few rules for dyspeptics, which we give below, publishing the same in our little work, "Digestion and Dyspepsia." Subsequently we printed the same in our journal, *Good Health.* A short time later they came back to us as an editorial in a popular magazine, published in London, and edited by an eminent physician, a member of the Royal Society. We feel highly complimented that our English friend is willing to give so hearty an indorsement of our views on this subject as to be willing to have them appear as his own. The following are the rules :—

1. Eat slowly, masticating the food very thoroughly, even more so, if possible, than is required in health. The more time the food spends in the mouth, the less it will spend in the stomach.

2. Avoid drinking at meals; at most, take a few sips of warm drink at the close of the meal, if the food is very dry in character.

3. In general, dyspeptic stomachs manage dry food better than that containing much fluid.

4. Eat neither very hot nor very cold food. The best temperature is about that of the body. Avoid exposure to cold after eating.

5. Be careful to avoid excess in eating. Eat no more than the wants of the system require. Sometimes less than is really needed must be taken when the digestion is very weak. Strength depends not on what is eaten, but on what is digested.

6. Never take violent exercise of any sort, either mental or physical, just before or just after a meal. It is not good to sleep immediately after eating, nor within four hours of a meal.

7. Never eat more than three times a day, and make the last meal very light. For many dyspeptics, two meals are better than more.

8. Never eat a morsel of any sort between meals.

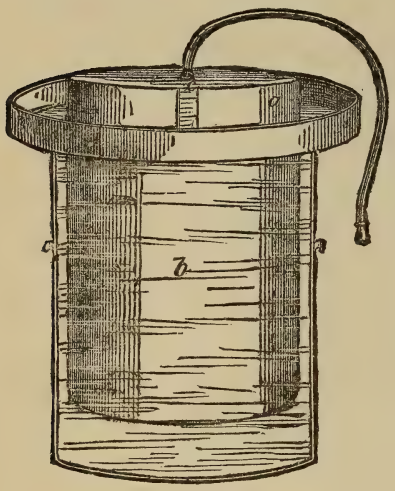
9. Never eat when very tired, whether exhausted from mental or physical labor.

10. Never eat when the mind is worried or the temper ruffled, if possible to avoid doing so.

11. Eat only food that is easy of digestion, avoiding complicated and indigestible dishes, and taking but one to three kinds at a meal.

12. Most persons will be benefited by the use of oatmeal, wheat meal, or graham flour, cracked wheat, and other whole-grain preparations, though many will find it necessary to avoid vegetables, especially when fruits are taken.

Vital Capacity.—By this is meant the number of cubic inches of air which can be exhaled after a deep inspiration. This has been found to have a direct relation to the hight of an individual. A person who is five feet and one inch in hight, has a vital capacity of 175 inches. Each additional inch in hight adds eight inches in vital capacity. Thus, a person measuring five feet eight inches in hight, should have a vital capacity of 230 cubic inches. The lung capacity is easily measured by means of a spirometer. An instrument of this sort, shown in the accompanying cut (see p. 536), and which will answer a very good purpose, may be made as follows:—



The instrument consists of two tin vessels, one inverted inside the other. The larger one should be nearly filled with water, and should have a small tube passing up through the center nearly to the top. This should communicate with a flexible tube outside, to the end of which is attached a mouth-piece which may consist of a short glass tube with a good-sized bore. By blowing into the tube, the inner vessel will be made to rise, and the amount of air expelled will be indicated by a scale accurately determined by previous calculation or experiment, and marked on the outside. If the inner vessel is eight inches in diameter, a scale may be made with lines one-tenth of an inch apart, each of which will represent five cubic inches of air. A person five feet high ought to be able to raise the scale three inches and a half, after taking a full inspiration. A person six feet high should be able to raise it five inches.

By the daily practice of the exercises described in the chapter on exercises, a person may increase his vital capacity very greatly.

When a person is exhausted from sedentary employment, the practice of deep and prolonged respiration with the chest well expanded, the shoulders back, and the spine erect, will be found exceedingly refreshing.

Development of the Body.—These paragraphs belong more properly to the chapter entitled, "How to be Strong," but are better given here than to be omitted. A vigorous and symmetrical development is something worthy of the ambition of every man; and it is worth while to know that while all cannot become athletes, every man may greatly improve his physique by proper daily exercise.

The following table represents, according to Maclaren, the proportions of the average healthy young man of nineteen, who has never had any special gymnastic training:—

Hight,	5 feet, 8¼ in.
Weight,	133 pounds.
Chest measurement,	33 in.
Fore-arm measurement,	10 in.
Upper-arm measurement,	10¾ in.

All of these measurements may be considerably increased by a few months' training. The hight may be increased from half an inch to two inches; the weight, from five to sixteen pounds; the chest measurement, one to five inches; the fore-arm, one-fourth of an inch to one and a quarter inches; the upper-arm, from one-half an inch to two inches.

Measuring the Body.—Before beginning a course of training, careful measurements of the body should be taken, so as to form a basis for comparison with subsequent measurements, and thus to determine the rate of improvement. These measurements should be made as follows:—

The Hight.—Stand with the back to the wall, the heels, hips, shoulders, and head touching it, the knees

well braced back, the shoulders square, and the chin up. The measurement should be made each time at the same time of day, and after the same amount of exercise, as a very noticeable difference will be found between measurements taken at night and morning, or before and after taking severe exercise.

The Weight.—The body should be weighed each time in the same clothing and at the same time of day. The best time is in the morning, and before any food or fluid has been taken. Care must be taken to avoid any circumstance that may influence the accuracy of the observation.

The Chest.—Stand with the arms extended horizontally, and have an assistant take the measurement with a tape passed around the chest in the line of the nipple. Two measurements should be made, one with the chest empty of air, and the other after a full inspiration.

The Upper-Arm.—Close the hand tightly, and bend the arm at the elbow, bringing the hand down near to the shoulder. Measure at the thickest part of the arm.

The Fore-Arm.—Extend the arm, and close the hand tightly. Measure at the thickest part of the fore-arm. The difference between the upper-arm and the fore-arm is usually one and a half to two inches. When the upper-arm is weak, the chest is usually weak also.

The Thigh.—Stand upon tiptoe, the knees well braced back and the toes pressed down against the floor as hard as possible. Measure as high as possible in a horizontal line.

The Calf.—Stand as for the preceding measurement, and pass the tape around the thickest part of the lower leg.

To Correct Deformities in Development.—Many deformities in development, such as round shoulders, curvatures of the spine, hollow chest, stoop shoulders, etc., may be corrected by the employment of the appropriate exercises. Lateral curvatures of the spine cause one shoulder to be lower than the other. The cause is weakness of the muscles of the back upon one side. The shoulder of the weaker side is higher than the other. This side should be exercised more than the other. In using dumb-bells or Indian clubs, the arm of the weaker side should use the heavier bell or club. The same principle applies to the use of pulley-weights and other exercises.

Dumb-bell and Indian club exercises, hanging by the hands, and the use of the pulley-weights with the back to the weights, are all excellent means of correcting hollowness of the chest and stoop shoulders.

Common Ailments.

A LARGE share of the accidents and ailments to which men and boys are subject may be successfully treated by a few simple remedies, and by the aid of appliances which may be found in every household. Many of these ailments are, from their apparently trivial nature, apt to be neglected, as the result of which they not infrequently give rise to very grave conditions, and become a cause of much suffering and inconvenience. Hence, information respecting the nature of ailments which are of such frequent occurrence, is of too great importance to be overlooked in a work of this character; and the knowledge of the simple means by which they may be relieved, is well worth the space which is devoted to the subject in this chapter.

Chronic Inflammation of the Throat, or Pharyngitis.

Symptoms.—Slight pain in swallowing; granular appearance of the throat; elongation of the palate; tough, tenacious mucus, occasioning hawking and spitting; "hacking" or "hemming" cough; husky voice; ex-

pectoration of small, cheesy or calcareous masses; slight hemorrhages from the throat in the morning.

Causes.—This disease is most commonly the result of repeated attacks of acute pharyngeal catarrh, though it not infrequently arises insidiously. The individuals most subject to the disease are those addicted to the use of liquor, tobacco-users, persons of sedentary habits, and those exposed to an atmosphere charged with dust or irritating gases. A humid atmosphere and changeable climate favor the production of this disease. Males are more frequently affected than females. It is found in its worst form in persons of vicious habits. What is known as clergyman's sore throat is a form of this disease, and it is undoubtedly the result of the sedentary habits of this class of persons. Diseases of the stomach and liver are frequently causes of pharyngeal catarrh. Bad dietetic habits are an important factor in the production of this disease. The use of mustard, pepper, vinegar, pepper-sauce, ginger, and various other condiments, and the excessive use of salt, sugar, fats, and animal food, must be set down among the principal predisposing causes of this form of the disease. In this way the terms "stomach cough" and "liver cough" have arisen, the stomach being really the remote cause of the cough, the direct source of which is the irritation in the throat. The most annoying symptom of chronic pharyngitis is the hacking or "hemming" cough, which is sometimes very harrassing. The cough arises in some cases from the irritation of the soft palate, and in others from the elongation of the palate. When the palate becomes so long that the end rests on the back part of the tongue, it is very likely to cause a most annoying cough, and efforts at expectoration.

Treatment.—The avoidance of all causes of the disease is of the greatest importance. The patient should adopt a plain, simple dietary, avoiding condiments, the use of fats, sugar, pastry, and all stimulating and clogging foods. If the patient has been addicted to the use of alcoholic liquors or tobacco in any form, these habits must be at once abandoned. Every possible measure should be taken to build up the general health by frequent bathing, keeping the skin in an active condition, as well as by out-of-door exercise and careful regulation of all the habits. Every night, before going to bed, apply a cold compress to the throat, and cover with a flannel. Remove in the morning, and bathe the parts with the hand dipped in cold water. Dry thoroughly, and in cold weather apply a little oil to the neck.

Apply daily to the throat by means of a swab, some astringent application, as tannin and glycerine, or alum and glycerine, in the proportion of one dram of either to the ounce of glycerine. In cases in which there is great dryness of the throat, astringent applications are not required. Some simple stimulating application, as gargling salt water, a teaspoonful to the pint, or a solution of chlorate of potash, will be found useful. In cases in which the throat presents a granular appearance, the galvano-cautery in the hands of a specialist is often required for a perfect cure.

ENLARGED TONSILS.

Symptoms.—Sensation of a lump in the throat upon one or both sides; difficulty in swallowing, in extreme

cases; voice changed, patient often being unable to pronounce certain words; great susceptibility to "cold in the throat;" constant irritation in the throat; in many cases, impairment of hearing.

The enlargement is sometimes confined to one side, but frequently both tonsils are affected. In some cases the enlargement is so great that the passage through the throat is almost entirely obstructed. We have frequently had cases in which the two tonsils came in contact, so great was the enlargement. Sometimes the enlargement is produced gradually. This is especially the case in scrofulous children. The results of enlarged tonsils are more serious than are generally supposed. They not only occasion permanent injury to the voice, giving it a nasal character on account of the partial paralysis of the soft palate, preventing complete closure of the passage to the nasal cavity, but not infrequently occasion serious injury to the middle ear from inflammation of the Eustachian tubes.

Treatment.—In cases of moderate enlargement, the treatment described for chronic pharyngitis may be given with success. Where the enlargement is very great, there is no remedy but removal. The operation is a trivial one, and should be resorted to promptly when its necessity becomes apparent.

In cases of moderate enlargement of the tonsils, and those in which the patient objects strongly to removal by the tonsillitome, the tonsil may be removed by the application of the galvano-cautery.

NASAL CATARRH.

A catarrh is a condition in which the scales or cells covering the mucous membrane are shed too rapidly. There is also in catarrh an abnormal activity of the mucous glands or follicles of the membrane. The skin, as well as the mucous membrane, is subject to catarrh. The disease commonly known as salt-rheum, a form of eczema, is a variety of catarrh of the skin. Catarrh of the skin is usually dry in character, the cells being cast off in the form of branny scales. It is, however, sometimes moist in character, especially when in the acute stage. So, also, we have a dry catarrh of the nose, although in the usual form of the disease there is a more or less profuse liquid discharge.

Chronic catarrh is not, as many persons suppose, a chronic inflammation of the part affected, but is a congestion, usually of a passive character. The blood-vessels of the affected membrane are greatly relaxed, and turgid with venous blood. The constant pressure of blood induces an excessive secretion, and the premature death of the covering cells. The secretion decomposes, and becomes acrid, increasing the irritation, and ultimately causing ulceration. The excessive blood supply of the membrane occasions swelling and abnormal growth. The membranes lining the nasal cavity and other portions of the respiratory tract become thickened, and various unhappy results follow.

Causes.—Among the most active of all exciting causes of catarrh of the nose and throat, is what is popularly known as taking cold. "A cold in the head" is essentially a slight fever accompanied by an acute

inflammation of the mucous membrane lining the nasal cavity.

A cold is usually looked upon as a very trifling affair, which scarcely needs serious attention, as it will work off of itself in a few days. This is really a grave error. Neglected colds are the most common cause, not only of catarrh of the nose and throat, but not infrequently of still more grave diseases, as chronic laryngitis and consumption. At best, a neglected cold leaves behind it an increased susceptibility to taking cold, so that another is contracted much more easily than the first; and this susceptibility to taking cold is increased until finally a very slight exposure, which would be in fact no exposure at all to a healthy person, will be sufficient to induce a severe cold, which may last for weeks, or even months. After a time, indeed, the susceptibility becomes so great that no exposure whatever is required to cause the individual to take a cold. A change of a few degrees in the barometer, or a slight variation in the temperature of a room, or a change in the direction of the wind, may be sufficient to bring on a fresh attack.

Thus what was at first only an occasional occurrence, colds being contracted only at long intervals, becomes, on account of serious exposure, a practically continuous condition, and a simple cold has resulted in a chronic catarrh. The frequent inflammation of the nasal membrane has caused its blood-vessels to become relaxed and dilated to such an extent that the condition is permanent, and the membrane is constantly congested, thus occasioning a too profuse secretion of mucus on the part of the glands situated in the membrane, and a too rapid exfoliation, or shedding, of the epithelial cells covering the membrane.

It may be well to consider some of the ways in which persons contract colds. In general, it may be said that a cold is occasioned by some violation of the laws relating to health, particularly those relating to the proper clothing of the body. The majority of bad colds are contracted in the spring and fall, as at these seasons of the year people are apt to be most careless in regard to the proper protection of the body. Many persons neglect to put on an extra suit of warm under-clothing sufficiently early in the fall to avoid an early cold; and probably an equally large number commit a similar error in leaving off the warm woolen under-suits too early in the spring, and before the weather has become settled. In this climate, the weather can scarcely be considered settled before the first of June; indeed, in some seasons the weather does not seem to be settled at all. A "cold snap" will sometimes occur in July and August, which creates as great a necessity for additional under-clothing as the approach of cold weather in late autumn. The only safe plan in relation to clothing is to wear woolen drawers and under-vests the year round. Some prefer a mixture of wool and cotton, and as a rule, such a fabric is more agreeable to the skin than pure wool. The summer suits may be as thin as desired; in winter, very heavy suits should be worn, and, in severe cold weather, two or three suits. The clothing should be carefully adapted to the weather. Extra cold weather in winter, and an extra exposure to the cold, call for one or two extra suits of under-clothing; and a cold spell in midsummer creates a still more urgent demand for extra clothing than a similar change in winter, as warm weather produces a condition of the skin

which is not so well prepared to defend itself against the cold as when it has been accustomed for some time to a lower temperature.

The clothing of the head is a matter of special importance. Men, as a rule, protect their heads by warm fur or felt caps or hats; but women are generally so enslaved by fashion that health is sacrificed for the sake of gratifying the perverse taste for displaying a fashionable bonnet, which cannot be considered as in any degree a protection to the head, being at best merely an ornament. Both the head and the neck should be sufficiently protected to prevent chilling. The wearing of heavy fur scarfs and mufflers is, however, a practice to be condemned, as the amount of heat thus induced is so great as to produce perspiration, and, as a result, increased liability to colds. Woolen wrappings for the throat possess the advantage of being pervious to the air, and consequently less liable to excite undue activity of the skin. The throat should not be enveloped in so many folds as to occasion an excessive degree of heat.

The practice of cutting the hair of men and boys very short, which has been much in vogue in recent years, must also be condemned as in the highest degree productive of catarrhal affections. The hair is intended as a protection to the scalp, and should be left sufficiently long to serve its purpose. No less to be condemned are the enormous masses of hair sometimes worn by ladies, which overheat the head, and injure the scalp by their great weight.

Too great stress cannot be laid upon the importance of proper clothing of the feet and lower limbs. Thin-soled shoes are scarcely better than no shoes at all, as

they rapidly conduct the dampness through to the feet. The sole of the foot is very largely supplied with nerves, and is one of the most sensitive portions of the body. It is on this account that a cold is contracted more rapidly by wetting or chilling the feet than by similar accidents to most other portions of the body. The shoes should be thick and warm, with heavy soles, and rubbers should be worn during wet weather, or when the shoes come in contact with moist surfaces. The wearing of rubbers or water-proof overshoes constantly, is not a healthful practice, however, as the moisture escaping from the surface of the feet is retained, so that they become wet, and injury may result as readily as though they were wet in any other way.

Somewhat extended opportunities for observation have led us to the conclusion that an inactive state of the liver has some influence in predisposing an individual to catarrh. We have observed that a torpid liver is, in the majority of cases, associated with nasal catarrh; and chemical examination shows that the discharges of the nasal cavity of a person suffering with catarrh contain a considerable quantity of cholesterine. The influence of diet, as the excessive use of fats, sugar, condiments, and numerous other unhealthful articles, in predisposing to catarrh, is unmistakable. Sedentary habits, by lowering the vital tone and lessening the resisting power of the individual, are predisposing causes which should be mentioned.

Symptoms.—The symptoms of acute nasal catarrh, or cold in the head, are too familiar to most persons to require more than a very brief description. The usual symptoms are chilliness; lassitude; pain in the forehead; a

watery discharge from the nose, which becomes yellowish and thick after two or three days; feverishness; coated tongue; and loss of appetite. The eyes are also frequently affected, being in most cases red and congested, and often suffused with tears. Frequently repeated acute catarrhs may finally give rise to chronic catarrh; however, the latter sometimes develops gradually, without being directly traceable to acute colds in the head.

Chronic nasal catarrh, with which we are chiefly concerned, presents varied symptoms in its different stages. In the first stage of the disease, which is usually known as simple chronic nasal catarrh, the symptoms are similar to those experienced in the last stages of acute cold in the head. There is a more or less copious discharge from the nose, either through the nostrils, requiring the frequent use of the handkerchief, especially in the morning, or through the passage to the throat at the back of the nasal cavity, as indicated by a dropping at the back of the throat. The patient suffers more or less with a dull pain over the eyes, in the cheek bones, or at the back of the head, which is increased in damp weather or whenever a slight cold is taken.

After a time the long-continued congestion and irritation of the nasal membrane gives rise to swellings and permanent thickenings of the mucous membrane and tissues underlying it in various parts of the nose, in consequence of which the several passages through the nose are more or less obstructed, so that breathing is interfered with, especially during sleep. On falling asleep, the patient involuntarily opens his mouth, not being able to secure a proper amount of air through the ob-

structed nostrils without the aid of the voluntary effort which he habitually makes during waking hours. The obstruction of the nasal passages is also indicated by a decidedly nasal tone in the voice, or rather, absence of nasal resonance in the voice, giving the voice the peculiar qualities produced by speaking with the nose closed. A similar swelling and enlargement occurs in certain glands at the foot of the pharynx, or point at which the nasal cavity and the pharynx unite, known as the pharyngeal tonsil. This enlargement sometimes becomes so great as to almost wholly obstruct the passage between the nose and the throat. We have met with cases where the opening, which is usually capacious, was not much larger than a goose quill. These obstructions produce, especially during sleep, various abnormal sounds in breathing. Snoring is always indicative of some obstruction of this sort.

Changes in the form of the nose also occur. The abnormal quantity of blood supplied to the mucous membrane lining the nasal cavity occasions an abnormal development of all the tissues; and an enlargement and thickening of the upper part of the nose occurs, and also, in many cases, an elongation of the septum of the nose, the cartilaginous extremity of which often becomes turned to one side. Very frequently, also, the central position of the septum deviates to one side, producing obstruction of the passage upon that side of the nose. Abnormal growths also appear in the nasal cavity, such as mucous and fibroid polypi, cartilaginous points, sometimes appearing as rounded prominences and in others as long ridges projecting from the vomer, either directly outward or downward. We have

frequently met cases in which nearly the whole nasal cavity was an abnormal growth of this kind. At the time of this writing we have under treatment a patient from whose nasal cavity we have, within the past few weeks, removed eight polypi, most of which were of considerable size, and obstructed the nasal passages in such a manner as to make breathing through the nose impossible.

In many cases of catarrh, especially those in which the disease has advanced so far as to produce abnormal growths and permanent enlargement of the structures within the nasal cavity, the disease is accompanied by an offensive odor. The breath at times becomes very foul, and the patient may be easily led to believe that extensive destruction of the tissues in the nasal cavity is taking place. This is due to the accumulation of secretions in the nasal cavity, which, on account of the numerous obstructions, cannot be thoroughly cleansed, either through the anterior or posterior openings, and in consequence of long retention the catarrhal secretions undergo decomposition, giving to the breath a peculiar and offensive odor, characteristic of this stage of the disease.

Dry Catarrh.—This state of things may continue for a few days or for a large part of a lifetime. Sooner or later, however, in the majority of cases, a still more advanced stage of the disease is reached, which is commonly known as dry catarrh. In this form of the disease, there is deficient activity of certain of the glands of the nose, due to atrophy or obstruction of the glands from long-continued pressure on account of the thickening and abnormal growths already described. There

are two kinds of glands in the nasal mucous membrane, one variety producing a thick, viscid mucus, the other, a liquid serum. The latter glands are destroyed first, so that the viscid mucus, which is not sufficiently fluid to escape through the passage of the nose, adhering to the surface of the mucous membrane, quickly dries, forming scabs, which soon putrefy, and produce an exceedingly bad odor. In some cases, the odor of the breath is so intensely fetid as to produce loss of appetite, and great impairment of the general health.

The patches of putrid mucus adhering to the mucous membrane produce excoriations, finally resulting in ulceration, which may even penetrate to the bony and cartilaginous structures of the nose, and thus occasion loss of the septum of the nose, and destruction of some of the bony prominences which project into the nasal cavity from the bones of the face. In this form of the disease, the patient usually experiences relief from some of the distressing symptoms suffered during the early stages of the malady. The obstruction to the nasal breathing is removed, and the various abnormal thickenings gradually shrink away, until the passage through the nose becomes so wide that the back of the throat can be easily seen through the nostrils. Patients of this class frequently remark that they suffered greatly with catarrh in early life, but have outgrown it, and wish treatment simply for the removal of the bad odor from the breath, to which their attention has usually been called by friends, it being generally the case that when the disease has advanced so far as in this class of cases, the sense of smell has been almost or entirely destroyed through the same destructive processes which

have removed the thickening and swellings which occurred in the earlier stages of the disease.

The effects of nasal catarrh are not entirely confined to the nasal cavity. The irritating discharges dropping down into the throat, occasion gradual extension of the disease into the pharynx, causing thickening of the mucous membrane of this part, hypertrophy of the tonsils, and elongation of the palate, which produces irritation of the throat, unpleasant tickling sensations, and a variety of other sensations of an unpleasant character. It also extends farther downward into the larynx, causing hoarseness and weakness of the voice, and occasionally its entire loss.

Treatment.—We have now come to the most important and practical part of this subject. The treatment of nasal catarrh has afforded a rich field for quacks, and has been a source of almost infinite annoyance to physicians. It is only in recent years, and since the subject has been taken up by scientific specialists, that the disease has been managed in anything like a successful manner. We have no universal panacea. The disease is one which possesses individual peculiarities to a very large extent, and can be successfully treated only by a careful adaptation of remedies to individual cases. In the first place, we must condemn utterly the use of any of the popular catarrh specifics, inhalants, etc. These remedies are usually such as have proven successful in a few instances, and will benefit a certain proportion of cases, but are quite as likely to do harm to a larger number. The various popular nostrums advertised for the cure of catarrh are composed of substances which have been well known to the medical profession for

years, and possess no such mysterious specific virtues as are attributed to them.

We shall notice the treatment of the various forms of catarrh in the same order in which they have been described, beginning with the simplest form, an acute catarrh, or "cold in the head."

How to Treat a "Cold in the Head."—To be successful, the treatment must be begun almost as soon as the cold is contracted. When an acute catarrh has already existed for two or three days, it is of no use to attempt abortive treatment, for the disease must run its course, although proper treatment will abridge the natural course of the disease, which is from three to six weeks.

If by exposure to cold air or a draught while the body is in a state of perspiration, by wetting the feet, or by similar means, the circulation has been disturbed, producing sneezing, snuffles, a stuffed feeling in the head, "watering" of the eyes, and a watery discharge from the nose (the usual symptoms of coryza), the patient must at once resort to some means to restore the circulation, and produce a proper activity of the skin, so as to withdraw the excess of blood from the mucous membrane of the nasal passages. An alcohol sweat, a vapor bath, a wet-sheet pack, a Turkish or Russian bath, or even a hot full bath, or any means by which vigorous activity of the skin may be induced, will be effective.

After taking treatment of this sort, however, it should be recollected that considerable danger is incurred, since the disturbed condition of the system, which involves the nervous system as well as the circulatory apparatus, renders the person much more liable to make

large accessions to the cold already contracted, than before the cold was contracted. The following plan is one well suited to home treatment:—

Within an hour or two of the time the first symptoms of the cold appear, let the patient drink copiously of some hot drink, which may be simply hot water, or weak hot lemonade, or diluted infusions of catnip, peppermint, or almost any one of the numerous domestic remedies used for this purpose. From two to three pints of hot water should be taken in the course of an hour or two. During the water drinking, some one of the various forms of hot bath mentioned should be taken, so as to produce vigorous perspiration, which will be aided by the hot-water drinking. After the bath, the patient should immediately go to bed, covering up warm with woolen blankets, so as to continue the activity of the skin in a moderate degree for several hours. If the bath is taken at night, the patient should receive, the next morning, a salt-rub, which consists in rubbing the whole surface of the body with common salt, mixed with water to the consistency of mush.

After the rub, the body should be sponged with tepid water so as to remove the salt, and then rubbed dry. The delightful smoothness of the skin which is produced by this means will be sufficient inducement to repeat the bath at sufficiently frequent intervals to overcome the susceptibility to chilling. The body should be rubbed with olive or cocoanut oil after the bath. Vaseline may be used in the absence of anything better. When a full sweating bath cannot be taken, a thorough sweat can sometimes be produced by a hot foot bath and copious hot-water drinking, followed by a few hours in bed, wrapped in warm blankets.

The unpleasant sensations in the nose and head can be best relieved by sponging or bathing the face with hot water, applying hot fomentations to the forehead or back of the head when there is pain in these parts, and snuffing up the nostrils a solution of common salt in water, a teaspoonful to the pint. The temperature of the water should be at least 105° or 110°, or as hot as can be borne without discomfort. When the throat is sore, hot fomentations or hot sponging should be applied to the throat, to be followed by a cold throat pack to be worn all night.

When the cold has continued two or three days, so that there is a thick, yellow discharge from the nose, and dropping at the back of the throat, the treatment must be such as will be recommended for simple chronic catarrh.

Treatment of Simple Chronic Nasal Catarrh.—This is by far the most common of all forms of nasal catarrh. It is chiefly characterized by the thick, yellow discharge which necessitates the frequent blowing of the nose, and the use of the handkerchief, or clearing from the throat the thick mucous discharges which are constantly dropping into it from the back part of the nasal cavity. Either or both of these prominent symptoms may be present, according as the disease is chiefly located in the anterior or posterior part of the nasal cavity, or throughout the whole extent of the nasal mucous membrane. Other symptoms of this form of the disease which we have previously described, we do not need to recapitulate. The examination of the nasal mucous membrane by means of instruments for the purpose, shows the affected portion to be red and swollen with congestion,

and covered more or less with a thick yellow discharge which is characteristic of this stage of the disease. The indications for treatment are two: 1. To cleanse the diseased mucous surfaces; and 2. To apply such remedies as will remove the congestion, and induce a healthy action in the mucous membrane.

Cleansing of the Nasal Cavities.—For this purpose a solution is required which will not irritate the mucous membrane, and at the same time will possess the property of dissolving the nasal mucus. Pure water will answer neither of these purposes. The fluid naturally secreted by the nasal mucous membrane is slightly saline. When pure water is injected into the nasal cavity, it is absorbed too rapidly by the mucous membrane, so that it becomes quickly swollen, producing pressure upon the sensitive nerves, thus giving pain. The addition of a small quantity of common salt or carbonate of soda increases the specific gravity of the water, giving it more nearly the character of the normal nasal fluid. The amount of salt required to produce a solution most nearly corresponding with the natural fluid, is one dram, or an even teaspoonful, to a pint of water. Both common salt and carbonate of soda, especially the latter, possess the property of dissolving with readiness the nasal mucus. Borax also possesses this property to some degree. These substances, therefore, are the proper ones for use in making the solution. The following formulæ are thoroughly satisfactory:—

1. Common salt, an even teaspoonful; soft water, warm, one pint. To be used in cases in which there is only a small quantity of discharge.

2. Common salt, one-half teaspoonful; carbonate of

soda, one-half teaspoonful; soft water, warm, one pint. To be used in cases in which there is an abundant discharge.

3. We frequently add glycerine to either or both of the solutions in the proportion of an ounce to the pint of the solution.

The temperature of the solution is a matter of no small importance. The water employed for cleansing the nasal cavity should never be at a temperature lower than that of the body, or about 100° F., and an extensive experience in the use of solutions of various substances and different temperatures has convinced us that hot water is more effective than warm. We had long held the belief that hot water would be found as effective in the treatment of nasal catarrh as it is well known to be in other parts of the body; but had been deterred from making decisive experiments by the belief that the thinness of the structures lining the nasal cavity was such that water of a high temperature would be intolerable. On making experiments, however, we found to our surprise that a very high temperature was borne without discomfort, and that a temperature considerably above that of the body was more comfortable than a lower temperature. In our experiments, a temperature of 130° to 140° taken in the reservoir, was found to be tolerated without discomfort. We believe that the temperature of the douche should be rarely less than 120° F., and may be employed at 130° in most cases, and even higher in some.

Having our solutions ready, we are now prepared for the operation of cleansing the nasal cavity, which is a very important part of the treatment of all forms of nasal

catarrh, and should be thoroughly understood and carefully practiced.

How to Cleanse the Nasal Cavities.—There are several methods by which the affected cavities may be thoroughly and effectively cleansed. Some of these possess special advantages, as simplicity, freedom from danger, etc. We shall mention first the most simple methods, which do not require other appliances than those which are found in every household.

First Method.—The simplest and most efficient method of cleansing the nasal cavity, consists in drawing water into the nose from the hand, snuffing it up with sufficient vigor to expose the whole surface to the cleansing action. After the solution has been prepared, care being taken to give it the proper temperature, a portion should be dipped up in the palm of the hand, shaped so as to form a scoop for the purpose, and, with the head bent forward so as to make the line of the face nearly horizontal, the water should be snuffed up strongly into first one nostril, then the other; refilling the hand, the head should be placed at an angle of forty-five degrees with the body, or about half way between the perpendicular and horizontal plane, and the operation repeated. Filling the hand again, it should be brought to the nose with the head held in a perpendicular position, the water being snuffed as before. By snuffing the water into the nostrils with the head held in these three positions, the whole nasal cavity, and even the extreme back portion, may be thoroughly cleansed. A sufficient amount of water should be used in each position, to secure the thorough cleansing of the nasal cavities from every particle of cohering mucus,—a condition

which will be indicated by the readiness with which the air can be drawn through the nostrils, and the sense of comfort and cleanliness which will be experienced when the cleansing is effectively performed.

Second Method.—A somewhat more convenient mode of cleansing the nasal cavities consists in substituting a sponge for the hand. The sponge, being saturated with the cleansing solution, is brought to the nose with the head held in the different positions previously indicated, and placed over the nostrils in such a way as to insure the entrance of the fluid into the nostrils when the air is drawn through the sponge. The entrance of the air and water together, which is secured by this method, as well as the preceding, is favorable to the most thorough cleansing, as the water is broken up into a coarse spray, which strikes forcible the various portions of the membrane, and dislodges the adhering mucus.

Third Method.—The nasal douche is one of the oldest methods in use for cleansing the nasal cavity, and when properly used, is a very satisfactory method. The requisite conditions for its proper use are: 1. A reservoir containing the water, which must be placed just above the level of the head, so that the water will flow gently through the nasal cavities without too great force; 2. The mouth should be held open with the head inclined slightly forward; 3. The patient should avoid swallowing while taking the douche. These directions are necessary to avoid the one danger connected with the employment of this method, namely, the liability of forcing a portion of the fluid through the Eustachian tubes into the middle ear, and thus setting up an acute inflammation, which may result in the

impairment of hearing. This accident has occurred so frequently in connection with the use of the nasal douche, that many specialists have condemned it altogether as too dangerous for common use. If the directions given are carefully observed, however, it may be used without danger.

Fourth Method.—The post-nasal douche is another method which cleanses the nasal cavities in a more effective manner than any one of the methods before given, and hence is especially adapted to those cases of catarrh in which there is a very troublesome dropping at the back of the throat. For administering the post-nasal douche, a tube shaped something like the italic letter *f* is required. The upper end of the tube must be passed into the mouth to the back of the throat, then upward behind the velum, or soft palate. The head should be inclined forward, so that the injected fluid may flow out through the nose with ease. The reservoir should be held a short distance above the head, so that the water will not flow with too great force. The same care must be observed respecting swallowing, as there is some danger of forcing water into the Eustachian tubes, with this method as well as the preceding. One of the best forms of syringes for administering both the nasal and post-nasal douches is that known as the syphon syringe, which is shown in use in the accompanying cut. The position of the patient as shown in the cut is not properly represented by the artist. The head should be inclined forward, as already stated.

Fifth Method.—Another very effective method for cleansing the nasal cavity, is by means of the air atomizer. The atomizer produces a coarse spray with

considerable force, and is best for this purpose. The spray should be directed into each nostril in various directions to insure cleansing of the entire surface, and in cases requiring it, may also be directed behind the soft palate, thus cleansing the back part of the nasal cavity also.

Medicated Solutions.—Having cleansed thoroughly the nasal cavity by some one of the various methods, we are now prepared to apply a medicated solution for the purpose of relieving the chronic congestion of the membrane, and inducing a more healthy action. In cases of simple catarrh, the thorough application of the cleansing solution alone is often sufficient to effect in time an entire cure. In very chronic cases, however, and in most severe cases, great good may be done by the application of solutions, astringent in character, which will cause the contraction of the blood-vessels of the swollen membrane, thus relieving the congestion and diminishing the secretion of the mucous and serous glands, and in this way gradually checking the discharge. A variety of astringent solutions may be used with good results. A point of paramount importance is that the solution should always be weak. Strong, irritating solutions should never be employed.

The following are among the most useful remedies of this sort which we have found: Sulphate of iron or copperas, sulphate of zinc or white vitriol, ferric alum, and tannin. Each of these should be used in the proportion of one dram by weight to the pint of soft water. A solution stronger than this should never be employed, and in some cases it will be necessary to diminish its strength at first by adding an equal quantity of water,

which should be gradually lessened until the membrane will tolerate the solution in full strength. The four remedies mentioned will usually accomplish all that can be done by medicated solutions in this class of cases, and our experience in using these remedies in hundreds of cases has led us to be well pleased with their effects. The medicated solution may be applied by any one of the methods above described, but we consider the air atomizer the best of all means of applying them, as it thoroughly distributes the solution over the entire mucous surface. The saturated sponge is perhaps the next best method for applying these solutions. Only a sufficient quantity should be applied to thoroughly cleanse the entire mucous membrane. From half an ounce to an ounce is sufficient to accomplish this. When the atomizer is used, a much less quantity will suffice.

While all the remedies mentioned are efficient, each one may be more especially adapted to some particular case, and hence one after another may be tried if the case proves obstinate, or two or more may be used in alternation.

We have been particularly pleased with the results following the use of ferric alum in a large number of cases, and have usually reserved the iron and zinc solutions for cases which would not yield to the remedy mentioned.

Hay-Fever.—Dr. Morell Mackenzie writes as follows respecting the management of this very eccentric and annoying malady :—

" The treatment of hay-fever is by no means satisfactory, and in no disease is the old adage, that ' prevention is better than cure,' more truly applicable than in

the case of this complaint. If the poison be continually introduced into the system, the antidote, if one exist, can have but little chance of effecting a cure. The first measure, therefore, must be to remove the patient from a district in which there is much flowering grass. A sea voyage is probably the most perfectly satisfactory step that can be taken. Patients who are unable to go to sea should endeavor to reside on the coast, where they will generally be free from their troublesome complaint, except when the land-breezes blow. Dwellers in towns should avoid the country, and those who reside in the country should make a temporary stay in the limits of a large town. It often happens, however, that such a change of abode is not practicable; and under such circumstances, if the complaint be very severe, the patient should, if possible, remain in-doors during the whole of the hay season. Many persons, of course, cannot keep in the house during the month or six weeks of the hay-fever period; and those who can are apt to find such detention not only irksome, but very injurious to the general health. If, therefore, a patient be obliged to go out of doors, he should plug his nostrils with cotton-wool or wadding, and should defend his eyes by wearing spectacles with large frames, accurately adapted to the circumference of the orbits. Plugging the lachrymal ducts with small glass rods has also been recommended, and Thorowgood speaks favorably of a little apparatus containing a few drops of camphorated or carbolized solution, which can be comfortably worn in the nostrils. Instead of *plugging* the nose, it has been advised to close it by compression with a little metal clip. As rapid motion in the open air almost always

aggravates the complaint, it may be advantageous to wear a veil over the face while driving. One made of 'three ply' of fine silk gauze has been found very useful. It is recommended that it should be made in the form of a bag open at both ends, one end fitting round the hat, while the other has attached to it a heavy wire ring about ten inches in diameter, which lies on the shoulders, and keeps the veil off the face. Those who do not mind being occasionally mistaken for the 'veiled prophet of Khorassan,' will, no doubt, adopt this plan. Protected in this way, many people predisposed to hay-fever escape altogether, while others contract the affection in a very mild form."

The unhappy victim of hay-fever who has to undergo the operation of having his nose stopped with cotton-wool, his lachrymal ducts plugged with glass rods, and his eyes encased in goggles, would undoubtedly be glad to wear a veil to hide his face from the curious gaze of the cruel public, and is certainly to be pitied; nevertheless, we have seen decided advantage gained by following the suggestion to plug the nostrils with cotton and protect the eyes when riding or walking in the open air.

We would add another measure of prevention not mentioned by the distinguished writer from whom we have quoted. Our observation has been that persons who suffer the most severely with hay-fever are invariably those who are subject to catarrh during other seasons of the year, usually in a chronic form, as a result of which the mucous membrane of the nose is in a swollen and thickened condition, obstructing the nasal passages to a greater or less degree. A slight additional irritation, such as the cause of hay-fever produces, is sufficient to

produce almost complete obstruction of the nose; and through reflex action, spasm of the air tubes of the lungs is produced, making breathing difficult, and often occasioning most aggravating distress.

Experience with a large number of cases of this sort has convinced us that hay-fever is a curable affection, notwithstanding the general belief to the contrary. There are always to be found in these cases certain sensitive points in the nasal cavity which may be treated by galvano-cautery applications in such a manner as to overcome the hyper-sensitiveness which gives rise to the distressing symptoms of the disorder.

Moist Tetter, or Salt-Rheum.—This disease is essentially catarrh of the skin. Its characteristics are too well known to require description. It is a scaly disease of the skin, usually attended by intense and persistent itching. The itching is generally most thoroughly relieved by hot bathing of the parts. If the hands or feet alone are affected, they may be soaked in water as hot as can be borne, several times a day, for ten or fifteen minutes, and on removal, a little olive-oil or cocoanut-oil should be applied, so as to protect the surface from the air. Sponging the parts with water in which bi-carbonate of soda has been dissolved in the proportion of one large teaspoonful to the pint of water, is a good means of affording relief. In advanced cases, in which the skin has become dry and thickened, with a tendency to crack, the use of an unguent of equal parts of zinc ointment and tar ointment is probably the most effective application which can be made. This preparation is much used in the skin hospitals of New York City and by specialists.

Warts.—Warts are due to excessive growth of the papillæ of the skin. They occur most frequently upon the hands of young persons. They are occasionally seen upon the face. The idea that warts are contagious has little foundation. Warts of the face are liable to degenerate into cancers.

Treatment.—After thoroughly oiling the skin about the wart, touch it with the end of a stick dipped in nitric acid. Acetic acid may also be used for the same purpose. The application should be repeated every few days until the wart is destroyed. Warts sometimes disappear very suddenly, which has given rise to the idea that they may be driven off by various maneuvers supposed to possess the power of dispersing them in a magical manner. It is possible that in these cases the imagination may be instrumental in effecting a cure.

Granular Sore Eyelids.—This very common affection is many times the outgrowth of a scrofulous habit of the system, but is not infrequently the result of repeated inflammations of the eyes. It sometimes results from a single attack of granular conjunctivitis. It ought to be known that the disease is sometimes contagious. It is often communicated through the medium of a common towel in families and boarding-schools. It cannot be contracted, as many people suppose, by simply looking at a person suffering with sore eyes.

One of the most efficient remedies is the hot water spray applied locally, or laving the eye with hot water. The temperature should be as hot as can be borne without discomfort, the application being continued ten or fifteen minutes, and made twice a day. We have cured, by this treatment alone, some very obstinate cases of

many years' standing, which had resisted many other methods of treatment.

Nettle Rash, or Hives.—This is a nervous affection of the skin in which blotches resembling those of the nettle-sting appear upon the surface, accompanied by itching and burning sensations. Disturbance of digestion is the usual cause. For immediate relief, bathe the parts with a solution of soda or saleratus, a teaspoonful to the pint of hot water. Simple sponging with hot water, or hot salt and water, a tablespoonful to the quart, is in some cases still more effective. The exciting cause must be removed to effect a permanent cure.

Constipation of the Bowels.—Inactivity of the bowels may be due to any one of several causes. One of the most common causes is a torpid state of the liver. In cases in which the stool is hard and dry, the immediate cause is deficiency of secretion on the part of the intestinal mucous membrane. The following suggestions will be found helpful: 1. Eat coarse food, such as cracked wheat, peas, beans, vegetables, etc. Avoid meat and condiments, tea, coffee, fats, pastry, and all unwholesome articles of food. 2. Drink two to four pints of water daily. The water should be taken an hour before the meal, and not within two hours after. 3. Wear at night a wet abdominal bandage, consisting of a towel wrung out of cold water dry enough so it will not drip, and covered with several thicknesses of dry flannel. The towel should be long enough to go around the body two or three times. It should be taken off in the morning, and the surface of the body rubbed for a while with the hand dipped in

cold water. Two or three times a day knead and percuss the bowels with the hands for five or ten minutes very thoroughly.

Boils.—A boil originates in the death of a small portion of the deep tissues of the skin, which generally involves a sweat or a sebaceous gland. Inflammation is the natural process by which the dead tissue is separated from the living. The boil first appears as a red and somewhat painful nodule in the skin, about the size of a bean or pea. Very soon a white point forms at the apex; swelling spreads about the center, usually attaining about the size of a dollar. At the end of four or five days, the central portion, marked by a white point, becomes loosened, and a discharge occurs consisting of a plug, or core, together with the matter, blood, and fragments of dead tissue. The suppuration generally ceases in three or four days.

Treatment.—Boils may often be cut short if treated early by continuous applications of ice. The best plan that can be recommended for general employment is the early application of hot fomentations, by which the pain may be relieved, and the natural process hastened. When there is a great deal of general irritability, warm full baths are very advantageous.

If the boil does not open promptly, it should be freely lanced, after suppuration has taken place, as shown by softening. Warm poultices should be continued after lancing. *Blind boils* should be lanced and poulticed. The practice of squeezing boils is a very injurious one, as the matter is thereby dispersed into the surrounding tissues, often producing a numerous

crop of boils in the vicinity of the first one. The discharge of matter should be secured by a large opening and gentle pressure.

A contributor to a medical contemporary asserts that he has cured boils while in their incipiency, during the last thirty years, by gently rubbing the red pimple which first appears, and claims that in a few moments the redness will disappear, and frequently the pimple itself, and all trace of inflammation will be obliterated. Boils should not be left to "come to a head." As soon as there is evidence of the presence of pus, they should be opened with a sharp lancet.

Corns.—Corns, or callouses, on the soles of the feet are often very painful, and occasion great inconvenience. If very tender and swollen, with redness of the tissues round about, the proper remedy is rest, lying in a horizontal position, accompanied by proper use of poultices, until the soreness and irritation disappear. After the tenderness has subsided, a loose shoe should be worn; and to relieve the corn of pressure, apply over it a thick piece of buckskin or felt, with an opening in the middle the size of the callous. By this means, the pressure can be wholly taken off the callous, and nature will in due time effect a cure. If the skin is very thick, it may be softened by the application of compresses wet in soda-water and saccharated solutions. In a short time, the skin becomes softened, so it can be easily scraped off.

Freckles.—There are two kinds of freckles. Those which are produced by exposure to sun and wind are very superficial, and are easily removed by such substances as will remove the superficial cellular layers of

the skin. Among the best remedies for this purpose are the following:—

1. Three tablespoonfuls of fresh scraped horse-radish; buttermilk, a pint. Allow to soak six or eight hours, shaking occasionally. Cider vinegar is sometimes used in place of the milk. Apply to the face at night, leaving on till morning.

2. Two tablespoonfuls of lemon juice; an equal quantity of water; a tablespoonful of glycerine; a heaping teaspoonful of powdered borax. Apply three or four times a day, drying after fifteen or twenty minutes with a fluffy towel.

Oily Skin.—In some persons there is an excessive production of sebaceous matter, or sebum, due to morbid activity of the fat glands of the skin. The skin of such persons presents a shiny look. Little beads of oily matter may be seen at the mouths of the glands near the roots of the hairs. The forehead, nose, and cheeks are most frequently affected. When the scalp is affected, the condition may be indicated by soiling of the pillow. Acne is frequently accompanied by this condition.

Treatment.—The only treatment to be employed is the frequent application of soap. When many of the glands are clogged up, as indicated by the abundance of grubs, the surface should first be thoroughly rubbed with warm oil. Cocoanut or almond oil is the best. After half an hour, the surface should be rubbed with a flannel cloth, thoroughly saturated with soap moistened with warm water, and stretched over the fingers; or a soft sponge may be used. This is best done at night, just before retiring. When the secretion of fat is very

profuse, the operation may be repeated two or three times a day.

Dandruff.—This is a condition in which branny scales are shed from the scalp in great abundance.

Treatment.—Restore the general health by proper attention to the digestion and general hygiene. For dandruff of the face, apply the same remedies recommended for the skin. The scalp should be treated in the same way, by gentle shampooing with ordinary washing soap, once or twice a week. A very soft brush should be used. Neither a stiff brush nor a fine comb should ever be used for removing dandruff. For shampooing, a liniment composed of equal parts of castor-oil and alcohol may be rubbed on the scalp, or an ointment composed of a dram of tannin to an ounce of vaseline.

Chilblains.—A gentleman called at our office the other day, suffering with what his physicians had termed eczema of the feet. The heels and sides of the feet were red and slightly swollen and exceedingly painful. The trouble began with freezing the feet several years ago, as we found by inquiry. The case was evidently one of chronic erythema, an inflammation or congestion of the skin, or what might not improperly be termed, chronic chilblains. The following treatment cured him: 1. Bathe the feet with very hot water for fifteen or twenty minutes every night; 2. After bathing the feet with hot water, rub them well with *benzoated zinc ointment.*

Foul and Profuse Perspiration.—Just before retiring at night, take a hot and cold foot bath, dipping the feet first in cold water then in hot, allowing them to remain in each for about one-half minute, and repeating the operation fifteen or twenty times. Then wipe with

a soft towel, and when nearly dry, rub with subnitrate of bismuth, using a large teaspoonful for each foot.

Piles.—Piles, or hemorrhoids, is a disease in which the veins of the rectum, through obstruction of the portal circulation, have become varicose. The tumors or hard bunches which protrude from the rectum are usually dilated or thickened veins, the distended walls of which frequently become so thin as to rupture, thus causing hemorrhage. This may vary in degree from a small streak of blood upon the passage to so great a quantity as to endanger the patient's life. A cure of this disorder consists in removing the cause, which may be a congested liver producing habitual constipation of the bowels, and, in most cases, removal of the hemorrhoidal tumors by some one of the various approved methods is necessary.

When a movement of the bowels is accompanied by very great pain, the patient will experience great relief by sitting over a vessel filled with very hot water, the steam arising from it causing the irritated parts to become relaxed. Take a hot sitz bath, temperature 104° F. Take a hot enema when the bowels move, temperature 105° to 110°, and repeat the enema after the movement of the bowels. The sitz bath and the enema may be repeated two or three times a day. When there is much bleeding, the use of a decoction of hamamelis, or witch-hazel, made by adding one ounce of the fluid extract to a pint of water, is beneficial. One-fourth pint of this decoction should be used by enema after each movement of the bowels, and at night just before retiring. The local application of a cold compress is a useful measure not to be neglected. Of the various ointments recommended for use, an ointment composed

of fl. ex. hamamelis one part and vaseline three parts, is one of the most useful. Subsulphate of iron is also a good astringent for use in these cases. It may be applied as an ointment, twelve grains to the ounce of vaseline. Use twice a day. In bad cases the patient must remain in a horizontal position until the hemorrhage is permanently controlled, or for at least half an hour after each movement of the bowels. Such cases require a surgical operation for a radical cure.

Red Nose.—This very annoying affection, which is usually, but not always, the result of the free use of alcoholic liquors, or indulgence in excesses of eating, may usually be relieved by very simple treatment if thoroughly carried out. The treatment consists in bathing the face and nose with water as hot as can be borne for five minutes three times a day. Once in two or three days the nose should be painted with two or three coats of flexible collodion, which will at once, by contraction, compress the dilated blood-vessels, and remove the red color. The only objection to the use of collodion is that it gives the nose the appearance of having been varnished, but one who is really desirous of being relieved of this source of annoyance, will be willing to put up with this slight inconvenience for a few weeks.

Baldness.—If the scalp is smooth and shiny, no remedy will be of any service. If small, fine hairs are present, improvement may be secured by the employment of such means as will stimulate the hair follicles. The best of all stimulants is bathing of the head every day with cold water, accompanied by gentle friction, as rubbing with the ends of the fingers until the scalp is red, and gently brushing with a soft brush.

Acne, or Face Pimples.—The small pimples which appear upon the face about the age of puberty are often very annoying, owing to the supposition that they indicate that the patient has been addicted to self-abuse, and sometimes make the individual very wretched, who happens to be afflicted with this very annoying affection. From quite extensive observations, we are inclined to think that acne is due to the cause mentioned only in very rare cases, except when it is confined to the forehead chiefly. The best means of relief are bathing the face with hot water two or three times a day, and the application once or twice a day of a mild astringent solution. We have found most useful a solution of white vitriol, or sulphate of zinc, one dram to the pint of water. It should be applied with a cloth or soft sponge, care being taken to prevent any of the solution from getting into the eye.

In obstinate cases of acne of long standing, especially that form known as *acne rosacea*, in which the face is covered by unsightly blotches, more radical measures of treatment are required; but the remedies to be employed are not such as can be safely placed in the hands of any one not skilled in their use. The author has found carbolic acid and acid nitrate of mercury, and the application of the galvano-cautery the best means of relieving these cases, and has always derived most satisfactory results from their use.

Mouth-Breathing.—Few persons are aware that this practice, so very common, is particularly harmful, and may be surprised when we say that it is exceedingly detrimental to health, even dangerously so. It is generally due to obstructions in the nasal cavities, either through

thickening or swelling of the mucous membrane, or the existence of polypi or other morbid growths. Sometimes it is due to habit merely. A child catches cold. The nasal passages become obstructed, necessitating mouth-breathing during sleep, when respiration is involuntary, and hence less forcible than during the waking hours. The cold is soon recovered from, but the habit has been contracted, and is continued even to adult years, or during an entire lifetime.

Enlargement of the tonsils is also a common cause of mouth-breathing.

Habitual mouth-breathing ultimately results in serious disease of the throat and larynx. It is also the cause of a peculiar malformation of the chest known as "pigeon's breast."

The remedy consists in the application of such measures as will remove the obstructions, if present. Polypi must be removed. Morbid growths must be removed or destroyed. Catarrh, if present, must be cured. If mouth-breathing is a habit merely, as is often the case, especially with children, care should be taken to instruct the child to breathe through the nose, and when he goes to sleep, the lips should be gently closed. By perseverance, the habit may be cured. In some cases, a cap for the head and chin, arranged in such a way as to hold the mouth closed, is necessary to cure this very injurious habit.

Sleeplessness.—This most annoying and exhausting symptom may be greatly relieved by attention to the following suggestions :—

1. Retire early, having taken, an hour or so before, sufficient muscular exercise to induce slight weariness.

2. Eat nothing within four hours of bed-time. If "faint" at the stomach, drink half a glass of hot lemonade. If this does not suffice, a mellow, sweet, or sub-acid apple may be taken an hour before retiring, unless fruit occasions pain or acidity.

3. If feverish, the skin being hot and dry, take a light hand bath with tepid water upon retiring.

4. If troubled with cold feet and hands, employ the means suggested for the cure of cold feet.

5. Sleep in a cool room, but take care to see that the bedding is well aired and dry, and the room well ventilated.

6. When nervousness causes loss of sleep, there are various methods of inducing slumber, one of the most efficient being slow, deep, and steady breathing. By this means the lungs are filled with blood, and the brain is thus relieved of the congestion which causes wakefulness.

Heart-Burn.—A teaspoonful of wheat charcoal, taken immediately after a meal, is an excellent non-medicinal remedy for this uncomfortable derangement of digestion. A teaspoonful of glycerine taken just before or just after a meal is useful for the same purpose.

Acute Sore Throat.—Among the best remedies for this common affection is hot water. It should be applied outside and inside; outside by means of flannels wrung out of water as hot as can be borne, applied to the throat and well covered, twice a day for fifteen minutes or half an hour. Gargle hot water, as hot as can be borne, every fifteen minutes or half an hour until relieved. Drink plenty of hot water, so as to get into a profuse perspiration. A few hours of this treatment will effect a cure in simple cases.

Sneezing.—This symptom consists in an explosive expiratory effort, the air being expelled through both the mouth and the nose, but chiefly through the former. It is oftenest occasioned by irritation of the nasal and mucous membrane. It may arise from titillation, inhalation of dust, congestion incident to taking cold, or congestion present in influenza and hay-fever. It is, in some cases, a purely nervous symptom. With many persons, sneezing is excited by looking at the sun or at a bright light.

Treatment.—This symptom rarely becomes so troublesome as to require special attention by way of treatment, and yet it is often at least convenient to be possessed of a remedy to check or relieve it. The disposition to sneeze can ordinarily be relieved by rubbing the nose between the thumb and finger. It may also be checked by pressing the finger against the upper lip, just below the nose. In some cases, the nasal douche, administered with a fountain syringe, is essential. The best solution to be employed is a teaspoonful of common salt, dissolved in a pint of tepid water, or fifteen to twenty drops of carbolic acid, well dissolved in the same amount of water.

Ivy Poisoning.—The susceptibility of poisoning by poison-oak seems to be due in a large degree to a sort of idiosyncrasy. Very few persons are likely to be poisoned unless they come in immediate contact with it. The result of poisoning with this plant is an inflammation of the skin, which in some cases is very violent. The best remedy in such an attack is application of cloths wet in cold water, or iced lime-water. Alternate hot and cold sponging of the part is frequently effective. The patient should drink a quantity of hot water,

which is useful in producing perspiration, and this should be followed by a wet-sheet pack or vapor bath. Sponging of the parts alternately with hot and cold water is of use in removing the swelling after the acuteness of the attack is passed.

The Tobacco Habit.—This habit, when well fixed upon an individual, is scarcely less difficult of abandonment, in many cases, than the use of opium. Some persons are able to renounce the accustomed pipe or cigar at once, even after the habit has been indulged for many years; while others are only able to succeed after repeated attempts.

Treatment.—The secret of success in the treatment of the tobacco habit, is in relieving the system entirely from the influence of the drug as quickly as possible. This is best done after the patient has discontinued the habit, by the use of hot-air, vapor, Turkish, and Russian baths, or by the use of the wet-sheet pack. The last-named remedy is quite as effective as any of the others.

Writer's Cramp.—Symptoms: Fatigue and a sense of insecurity in the arm and hand; patient grasps his pen too firmly; fingers seem clumsy; pen jerked up and down by twitching of the muscles of the hand and arm.

Treatment.—In many cases, absolute rest of the affected muscles is necessary. This frequently necessitates a change of occupation. Every possible attention should be given to improvement of the general health. The application of galvanism to the affected muscles is an effective remedy in many cases. Hot sponging, alternate hot and cold applications, and massage are also of use. Some patients obtain the needed relief of the affected part by learning to write with the other hand; but, un-

fortunately, in many cases this also becomes affected. Some relief from the disagreeable jerking may be obtained by the use of quill or stub pens. Fastening a sponge to the pen-holder at the point at which it is held is sometimes beneficial. Some persons find relief to a considerable degree by grasping the pen between the first and second fingers, instead of between the thumb and forefinger.

The most recent, and apparently the most successful, method of treating writer's cramp is by means of massage. This is applied in various ways, according to the indications of each particular case.

Varicose Veins.—This is a condition in which the veins are greatly dilated, and become tortuous in their course. It is occasioned by occupations which require long standing upon the feet, by constipation, and especially, in women, by pregnancy.

Treatment.—The disease is seldom cured; but its inconvenience may be greatly lessened by the use of the elastic silk stocking or the elastic bandage. The latter measure we very much prefer for the majority of cases. The bandage should be applied from the toes to above the affected part. It should be wound smoothly and with even pressure. Little pressure is required, as the natural swelling of the limb in standing will produce all the tension necessary, although a very slight pressure may be employed in the application of the bandage with the limb in a horizontal position. The patient should take care to keep the affected limb horizontal or slightly elevated as much as possible, so as to encourage the flow of the blood toward the heart. Sometimes the dilatation of the vein becomes so great that rupture occurs. In

case of such an accident, the patient should at once elevate his limb as high as possible, and place a small roll of cloth, as a folded pocket handkerchief, over the point of the rupture, applying strong pressure over the compress. Recent improvements in surgery render it possible to effect a radical cure of this disease by antiseptic ligation.

Nosebleed.—Here are a few of the best remedies for this very common and sometimes dangerous affection:—

1. Have the patient raise both arms above the head. This will cause contraction of the blood-vessels in the arms, and simultaneously in the mucous lining of the nasal cavity. In mild cases, this remedy will uniformly succeed with promptness. A dry handkerchief should be held to the nose in the meantime.

2. Administer a nasal douche of a hot solution of common salt. Dissolve a tablespoonful of salt in a quart of water at a temperature of 130°, and administer with a fountain syringe, inserting the nozzle of the syringe in the nostril which does not bleed, and allowing it to run out of the other.

3. Apply hot water to the feet, ankles, hands, and wrists, and at the same time have another person applying napkins wet in cold water to the throat and neck.

Ear Discharge.—Cleanse the ear by means of a douche administered with a fountain syringe, allowing the fountain to hang only a few inches above the head. After the ear is thoroughly cleansed, carefully dry the canal by means of small bits of absorbent cotton wound about the end of a wooden tooth-pick. Then blow into the ear from a quill tooth-pick or a rubber tube a small quan-

tity of finely powdered boracic acid. It is well to fill the canal quite full with the powder. Repeat this every other day. A few weeks' treatment will usually effect a cure, even in the most obstinate cases.

Burning Feet.—Bathe the feet night and morning with tepid water, to which a little soap has been added. When nearly dry, dust freely over them a powder composed of one part of salicylic acid and sixteen parts of powdered alum. If the burning is especially troublesome at night, dip in hot water for fifteen minutes before applying the powder. A jug filled with cold water is a good palliative.

Erysipelas.—A local attack of erysipelas may often be cut short by painting the parts with collodion. The application of wet compresses, with occasional fomentations to relieve pain, is also advantageous in these cases.

Ringworm.—This disease is caused by a vegetable parasite, and is very contagious. It is undoubtedly communicated from one person to another by the use of a common comb or brush. It frequently prevails extensively among the inmates of reformatory institutions, and sometimes among school children, when proper precautions are not observed. One of the best remedies is a solution of hyposulphite of soda. It should be applied to the affected parts with a soft sponge, after they have been thoroughly cleansed. The application should be made daily until a cure is effected. In bad cases, the hair should be cut close to the scalp before applying the medicated lotion. Spirits of turpentine containing tincture of iodine in proportion of twenty drops to the ounce, is reputed to be an excellent remedy.

Hiccough.—Moisten a little sugar with strong vinegar, and take a few teaspoonfuls. In very bad cases, a few drops of chloroform may be given on sugar.

Sunstroke and Heat Exhaustion.—When a person is suffering with sunstroke, the face is red, the temples are throbbing, and the skin is hot. The proper treatment is to immediately put the patient in a cold bath if possible, or douse him with cold water. Pouring cold water on the head and over the body is a means which should be employed, if a well is near. No time should be lost in applying this important measure of treatment.

Heat exhaustion is a condition very different from sunstroke. The surface is likely to be cool instead of hot, and the patient requires hot applications instead of cold. He should be put into a hot bath, or have hot fomentations applied to the head and spine, while the body is sponged with hot water.

Bruises.—A bruise should be immediately followed by hot fomentations, which should be continuously used for three or four hours. In this way the discoloration of the skin can be almost entirely prevented, and often wholly.

Ingrowing Toe-Nails.—This difficulty generally affects the outer side of the great toe. It is generally produced by wearing narrow-toed shoes or boots, and trimming the nails too closely at the corners. In consequence of the pressure of the shoe, the edge of the nail is forced down into the flesh, producing much pain and irritation, especially in walking. Cutting away the edge of the nail does no good, as it will soon grow out, and the difficulty will be aggravated. When the irritation is ex-

treme, and kept up for a long time, inflammation and even ulceration may occur.

Treatment.—When there is much soreness or inflammation, soak the feet in water as hot as can be borne, two or three times a day, and apply cool compresses the rest of the time, giving the feet entire rest. When the inflammation is considerable, subdue it in this way: The center of the nail should be scraped very thin, a notch should be cut in the center at the end, and the edge should be raised by carefully drawing under it threads of floss silk.

For radical cure, an operation consisting of removal of the thickened flesh about the edge of the nail is required. The application to the sore point of pure carbolic acid is also useful.

Hang-Nail.—This is a little portion of partially detached tissue adjacent to the nail, which is usually the result of a slight injury of some kind, and by constant contact with various objects becomes inflamed and quite annoying.

Treatment.—Clean the nail carefully, dry with a bit of absorbent cotton or soft cloth, and apply an adhesive plaster. It should be renewed every day or two until the cure is completed. If a considerable degree of inflammation has been excited, and there is a raw surface of considerable size, a little powdered alum or tannin should be applied before the application of the plaster.

Burns and Scalds.—Protect the injured part from the air by covering with oil or vaseline, or equal parts of oil and lime-water. The most effective means of relieving the suffering from burns, is by immersion in water at a temperature about that of the

body. At the Royal hospital in Vienna, where the author spent some time a few years ago, patients are kept in baths frequently with the whole body immersed for several months. The new skin forms very readily under this treatment, and great comfort is afforded the patient. The water must be kept only slightly below that of the body, and must be changed two or three times a day.

Sprains.—Give the parts rest at once, and apply hot fomentations. If the part becomes swollen and hot, apply hot fomentations every two hours, and continuous cold applications between. The greatest danger from sprains is from using the parts too soon. A severe sprain requires as long a time for recovery as a fracture, and is often a more serious injury.

Muscular Strains.—If the muscles have been strained by too heavy lifting or too violent exercise, take a hot bath, or sponge the parts with hot water, and give the overworked parts entire rest until all soreness is gone.

Migraine, or Nervous Headache.—This disorder is usually considered exceedingly difficult to cure, but under hygienic treatment it proves very manageable. Usually the patient is suffering with slow digestion; the bowels are likely to be stopped, tongue coated, and patient's appetite capricious. When an attack is threatened, the patient should take from three to six glasses of hot water every one or two hours, and apply hot sponging to the spine and head, resting quietly in bed until the threatening symptoms disappear.

CHOICE PRESCRIPTIONS.

For Sexual Nervous Debility.—

℞.	Sodæ Brom.,	dr. 4.	
	Ammon. Brom.,	dr. 4.	
	Aquæ,	oz. 3.	M.

Dose: Take in water one teaspoonful at night, on going to bed.

℞.	Atropia Sulph.,	gr. ½.	
	Aquæ,	oz. 4.	M.

Dose: Teaspoonful at night.

These two remedies are very useful in cases which the nocturnal losses occur with great frequency, and are not readily controlled by the simple means recommended elsewhere in this work. They are the only drugs which we consider of any value whatever in the treatment of these maladies. They must not be depended upon for effecting a cure, however. They only palliate symptoms, and give temporary relief from one of the most annoying symptoms.

For Balanitis.—

℞.	Zinc Sulph.,	dr. ½.	
	Aquæ Rosacæ,	pt. 1.	M.

Apply to the parts after cleansing and drying with lint.

℞.	Alum,	dr. ½.	
	Aquæ,	pt. 1.	M.

Apply same as preceding.

℞.	Acid Tannic,	dr. ½.	
	Aquæ,	pt. 1.	M.

Apply same as preceding.

℞.	Distilled extract of Witch-hazel,	oz. 2.	
	Aquæ,	oz. 4.	M.

Apply to the parts affected, after cleansing.

Herpes of the Prepuce.—

℞.	Sulphate of Zinc,	dr. 1.	
	Aquæ,	pt. 1.	M.

Apply to parts twice daily, after cleansing.

℞.	Alum,	dr. 1.	
	Aquæ,	pt. 1.	M.

Use same as preceding.

℞.	Zinc Oxide,	gr. 4.	
	Starch,	oz. 4.	M.

Apply to parts twice daily after cleansing.

℞. Tannin, gr. 4.
Starch, oz. 4. M.

Use same as preceding.

For Catarrh.—

℞. Common Salt, dr. 1.
Aquæ (hot), pt. 1. M.

Use by means of sponge, nasal, or post-nasal douche, to cleanse nasal cavities.

℞. Common Salt, dr. ½.
Sodæ Carb., dr. ½.
Aquæ (hot), pt. 1. M.

Use same as preceding.

℞. Common Salt, dr. ½.
Borax, dr. ½.
Acid Carbolic, drops 20.
Aquæ (hot), pt. 1.

Use same as preceding in cases of offensive catarrh.

℞. Ferric Alum, dr. 1.
Aquæ, pt. 1. M.

Use with atomizer following a cleansing lotion, in cases of catarrh with profuse discharge.

℞. Sulphate of iron, dr. 1.
Aquæ, pt. 1. M.

Use same as preceding.

℞. Zinc Sulphate, dr. 1.
Aquæ, pt. 1. M.

Use same as preceding.

℞. Distilled Extract of Witch-hazel, oz. 3.
Aquæ, oz. 6. M.

Use same as preceding in cases in which the discharge is slight.

℞. Iodoform, dr. 2.
Starch, oz. 1. M.

Use as a snuff, after cleansing, in cases of catarrh with little discharge but offensive breath.

℞. Camphor, gr. 2.
Iodoform, dr. 1.
Starch, oz. 1. M.

Use as snuff, after cleansing, in cases of painful catarrh.

℞. Boracic Acid, dr. 1.
Starch, oz. 1. M.

Use as snuff, after cleansing, in cases of catarrh attended by irritation of the nostrils.

Chronic Sore Throat.—

℞.	Alum,	dr. 1.	
	Glycerine,	oz. 1.	M.

Apply to throat with a swab.

℞.	Tannin,	dr. 1.	
	Glycerine,	oz. 1.	M.

Use same as preceding.

℞.	Chlorate of Potash,	dr. 1.	
	Aquæ,	oz. 4.	M.

Use with steam atomizer.

℞.	Nitrate of Silver,	gr. 2.	
	Aquæ,	oz. 1.	M.

Apply to throat with swab in cases of chronic pharyngitis attended by dryness, and in cases of acute pharyngitis.

For Dandruff.—

℞.	Alcohol,	oz. 3.	
	Castor-oil,	oz. 3.	M.

Apply to scalp every other day, after shampooing.

For Sore Eyes.—

℞.	Zinc Sulph.,	gr. 2.	
	Aquæ,	oz. 4.	M.

Apply a few drops to the eye twice a day, in case of chronic conjunctivitis.

℞.	Acid Tannic,	dr. 1.	
	Glycerine,	oz. 1.	M.

Apply to the inner surface of the lids with a brush, immediately washing off with a brush dipped in water, in severe cases of chronic mucous or catarrhal conjunctivitis

Piles.—

℞.	Fl. Ex. Hamamelis,	dr. 4.	
	Vaseline,	oz. 1½.	M.

Apply to the affected parts, after cleansing with cold water, each time the bowels are moved.

℞.	Distilled Ex. of Witch-hazel,	oz. 4.	
	Aquæ,	oz. 4.	M.

Introduce one ounce of the solution into the rectum at night, and retain.

Ringworm.—

℞.	Hyposulphite of Soda,	dr. 2.	
	Aquæ,	oz. 4.	M.

Apply to scalp after thorough cleansing, twice a day.

℞.	Tinct. Iodine,	dr. 1.	
	Spirits of Turpentine,	oz. 3.	M.

Use same as preceding.

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APPENDIX
FOR
MAN * THE * MASTERPIECE.

VENEREAL DISEASES.

THERE are three distinct disorders which owe their origin to social vice, known respectively as *gonorrhœa* or *clap*, *chancroid* or *soft chancre*, and *syphilis*. These disorders, arising in the same way, by illicit coitus, were until the present century supposed to be identical in character. It is now known, however, that the three maladies are entirely distinct, although it is possible, indeed, that a person may be suffering from the three forms of disease at one and the same time. While these diseases differ greatly in the character and degree of their effects upon the body, they may all be classed among the most horrible of the numerous disorders to which the human body is subject. Our purpose in mentioning them here is certainly not to encourage the transgressor by the fact that there are means by which he may mitigate the punishment which nature inflicts upon those who transgress the laws of both God and man, but rather to present so truthful a picture of the terrible consequences of these maladies that he who is not deterred by the promptings of an active and well-trained conscience from going astray from the path of virtue, may, perhaps, be influenced by considerations which appeal to the instinct of self-preservation.

How these diseases originated, is a matter which has been the subject of much discussion. Those who have witnessed the terrible ravages of venereal diseases upon the human form, illustrations of which may be constantly found in almost any large hospital, have sometimes given

expression to the thought that the punishment inflicted was so indescribably horrible that it might be considered as almost too severe a penalty, notwithstanding the gravity of the offense committed. Wonder has been expressed how a kind and merciful Creator could ever have created such maladies for the purpose of inflicting human torture. It is well to bear in mind in this connection, that the penalty prescribed by the almighty Lawgiver in the penal code given through Moses to the children of Israel, exacted death as the penalty for transgression against chastity, so that the natural law enforced by the hand of disease is wholly consistent with the criminal code executed by man in the ancient Hebrew dispensation. Indeed, the justice of the death penalty for the violation of the laws of chastity is recognized by the laws of many nations, especially half civilized or semi-barbarous tribes whose laws are chiefly the result of a survival of some of the ancient traditions or of the natural process of social evolution which has taught it as a necessity for the preservation of chastity, as a measure of safety to the common good.

But we may say of these considerations that modern medical science, which has subjected to the most careful scrutiny the question of origin as relating to all venereal diseases, leans strongly to the theory that these disorders are the result of man's own misdoings, and were never especially created as inflictions upon the human race. The probability of this theory as relating to other disorders, we need not here discuss; but it seems to be pretty clearly made out that venereal diseases, at least, are the result of venereal excesses. By this we do not mean that the worst forms of venereal disease are likely to rise in individuals otherwise healthy simply from sexual excess alone, without exposure to individuals also suffering with venereal disease, though this is known to be true respecting some forms of venereal disorders; but we wish to intimate that venereal diseases have sprung up as the result of profligacy and vice, coupled with various conditions and circumstances, the nature of which may not be thoroughly understood, but which may be considered to have been sufficient to convert a disorder, at first but slightly contagious, into

a virulent malady most destructive in its effects upon the human form. Syphilis—in its usual manifestations—is not more destructive to human life than scrofula or consumption, and it has been intimated that the three formidable diseases mentioned are only different phases of one primary malady.

Whatever may have been the origin of venereal disorders, it is well known that their manifestations have varied greatly in intensity since they have been the subject of careful medical study. Sometimes they have been observed to be so mild in character that they were scarcely more formidable than most of the common ills to which the human body is subject; while at other times they have broken out with a virulency which could be fitly compared to nothing but a tornado or a cyclone within the human body. The transition from the mildest forms of these disorders to their most virulent manifestations, is certainly much greater than from a simple innocuous disorder to the milder forms of venereal diseases.

GONORRHŒA, OR CLAP.

This disorder, formerly believed to be a specific malady, is now generally held to be a simple urethritis, or inflammation of the urethra. The disease has been known from very ancient times. It has been suggested that it was quite common in Eastern countries at the time of the ancient Hebrews, and this fact has been assigned as the reason for the enforcement of circumcision among this people. How much truth there is in this suggestion, must, of course, be left to conjecture. It is known to have existed among the ancient Greeks and Romans, and was probably quite prevalent among those nations during the periods when they were so deeply sunken in licentiousness that even their religion was largely composed of lascivious rites, their temples were turned into brothels, and chastity was the rarest of all virtues.

Causes.—The ordinary cause of gonorrhœa is impure sexual contact. It is not absolutely essential that the woman should herself be suffering with gonorrhœa in order to communicate it to a man; for prostitutes are

frequently the medium of communicating the disease from one man to another without themselves being affected by it. Repeated attacks frequently establish a sort of immunity from the disorder, just as an attack of small-pox protects from subsequent attacks, though in the case of this disease the protection is far less perfect.

It is now very well known that the gonorrhœal disease may be produced by other causes than contact with the discharge. One of the most obstinate cases of the disease which the author was ever called upon to treat, was a case in which the evidence was as complete as could be desired, that it was the result of exposure to the menstrual discharge. Most medical men of large experience have met cases in which gonorrhœal discharge in men had originated from a leucorrhœal disorder in their wives. Certain strongly irritating substances, as ammonia, injected into the urethra, produce the same sort of discharge, and a case has been recorded in which a real attack of gonorrhœa was induced in a sailor by sitting for some hours on a wet dock while in a state of intoxication. Intemperance and excessive venery are known to be frequent causes of the disease, especially if there has been previously present a chronic catarrhal discharge. Diday, an eminent French physician, believes that excessive coitus is the most frequent cause of gleet; while Ricord asserts that the free use of beer, and the eating of asparagus must be accredited with being exciting causes of the malady.

Gonorrhœa is usually confined to the urethra, but may affect the glans penis and the prepuce, or foreskin. It usually begins at the outer extremity of the urethra, and gradually extends backward, remaining most obstinately fixed at the slightly enlarged portion of the urethral canal just within the mouth of the meatus, and that portion known as the bulb, located just in front of the membranous or prostatic portion of the canal. The disease may extend to the bladder, and through the seminal ducts to the testicles. It is not wholly confined to the mucous membrane, affecting also the deeper tissues.

Symptoms.—The characteristic symptoms of the disease begin to make their appearance in two to five days after exposure. The first symptoms felt are those of

slight uneasiness, itching or tickling of the meatus, which is redder than usual, the lips slightly swollen and stuck together by a colorless, viscid secretion. The secretion quite rapidly increases, and becomes opaque or milky in appearance. On urinating, a slight smarting is felt. This state may last from a few hours to two or three days. The inflammation, which at this time is confined entirely to the outer end of the urethra, gradually extends, and sometimes until the entire organ is affected. The mucous membrane covering the glans becomes swollen and inflamed. The foreskin also sometimes swells to such an extent that it cannot be drawn back over the glans. The discharge increases in quantity, and becomes thick and greenish. The whole course of the urethra, as felt along the under side of the penis, is swollen and tender. The passage of urine is accompanied by intense scalding sensations; and the urine can be emitted only in small quantities at a time, owing to a contraction of the muscles of the urethra. When the back part of the canal is affected, the patient has a feeling of weight and pain in the perineum, which is greatly increased by erection. When the patient becomes warm in bed, he suffers from violent and involuntary erections. The inflamed condition of the urethra and the surrounding tissues will not allow the lower portion of the organ to expand in that direction, causing it to become curved with the concavity downward, and acts like the string on a bow, curving the organ so as to cause great pain and suffering. This condition is known as *chordee*. Sometimes abscesses form in the urethra. This stage lasts from one to three weeks.

After a time, usually one to six weeks, the inflammation subsides; but the discharge may continue indefinitely, without symptoms of inflammation, though there is sometimes slight smarting on passing urine. This form of the disease is known as *gleet*, and may last for a few weeks, several months, or even years. In this condition, a slight discharge occurs after rising in the morning, and the lips of the urethra are found gummed together. By pressing along on the under side of the penis, a small quantity of discharge may be expelled. The discharge may be simply a clear mucus, which is usually prostatic

secretion, or it may be milky or purulent. While this discharge remains, coitus, sexual excitement, exposure to cold, exciting foods and drinks, etc., may be sufficient to produce an increase of irritability, and the return of the symptoms of the original gonorrhœa.

Sometimes the character of the discharge passes through the same changes in recovery, though in inverse order, as are noted in the outset of the disease. After a time, the discharge ceases to be virulent, and comes to consist almost entirely of mucus, as at first.

The true discharge of gleet is either transparent or of the appearance of milk and water, and the yellowish white discharge is due to *chronic gonorrhœa*, a condition in which the disease becomes chronic in an earlier stage than gleet. Properly speaking, the term *gleet* should be confined to the condition in which the milk-and-water discharge is present, the transparent discharge indicating simply a slightly increased activity of the urethral glands, or catarrh of the mucous follicles. The last-named condition may fairly be considered as closely related to gleet, however, since the milk-and-water discharge is so prone to return on exposure to any of the excesses named as likely to produce a relapse.

The continuance of the discharge in the form of gleet, is often the result of improper or incomplete treatment of the gonorrhœal disease. Not infrequently it is due to chronic inflammation of some of the deep portions of the urethra, to morbid growths resulting from the gonorrhœal inflammation, or to stricture of some portion of the canal. It may also arise from inflammation of some of the glands connected with the urethra, continuing after the gonorrhœal inflammation has subsided.

The disease is likely to be perpetuated by bad bodily conditions, as scrofula, rheumatism, gout, and general grossness of the system. It may also be kept up by improper habits of diet, by indulgence in sexual intercourse, intemperance, the use of tobacco, and similar causes. It was held by the earlier writers on this subject that gleet was not contagious. Modern observations have established beyond controversy the fact that any discharge from the urethra following gonorrhœa, with the exception of the simple transparent catarrhal

discharge above described, may be communicated. It is at least established that the disease may be communicated, or at least at any time transformed into a communicable discharge, by any of the excesses which set up urethral irritability. The effects of gonorrhœa upon the general health, when the disease is at all severe, are very marked. The individual loses flesh, assumes a listless appearance, is pale, and the general strength is materially impaired.

Gonorrhœa of the prepuce, or foreskin, commonly known as *balanitis*, may result from want of cleanliness, or from exposure of the parts to cold, as in sitting upon the damp ground. The proper remedies are thorough cleanliness, and the application of a little lime-water or astringent solution if the affection is at all obstinate.

Treatment.—The severity of an attack of gonorrhœa depends, first, upon the virulency of the disease in the person from whom it is received, and secondly, upon the condition of the system of the individual receiving it. The worst cases of gonorrhœa are those seen in persons who have contracted the disease during a debauch, when the system was exhausted by dissipation and inflamed by alcohol. The first measure of treatment consists in rest. If the individual is so situated that he can go to bed at once, and remain quiet in a horizontal position, the severity of the disease will be greatly mitigated, and its course shortened by this procedure alone. The controlling influence of rest upon this disorder is so great that some eminent physicians have recommended rest, cleanliness, and a light diet as the only measures of treatment needed, if faithfully carried out.

The diet should be unstimulating in character. Flesh foods, tea, coffee, and condiments should be discarded. The patient should confine himself to a diet consisting chiefly of milk, grains, and fruit. To render urinating less irritating to the inflamed surfaces, an abundance of warm or hot water should be taken. From six to twelve glasses should be taken in the course of the day, preferably one hour before each meal, and half an hour before retiring at night. If obliged to be on the feet, the parts should be sustained by a proper suspen-

sory bandage. The bowels must be kept open by the liberal use of fruit, and, if necessary, the employment of the enema. Tobacco must be wholly avoided, as its influence upon the disease is in the highest degree pernicious.

The patient should take a daily sponge bath in tepid water, to be followed by vigorous rubbing of the surface.

Among the local measures to be employed, we attach the greatest importance to the hot urethral douche, hot sponging of the parts, and the warm sitz bath. These afford the greatest relief to the symptoms which give rise to suffering and inconvenience in the disease, and exert a decided influence upon its duration. If given at the very beginning of the attack, the hot urethral douche, if thoroughly employed, will in most cases effect a cure in from two or three days to a week. It should be given as follows :—

The Urethral Douche.—Obtain five or six feet of rubber tubing, such as is usually employed with the fountain syringe. Also procure a gum elastic catheter, about number eight in size. Purchase a four or six quart tin pail, and have a tin-smith put into the side, close to the bottom, a small nozzle of sufficient size to allow the tubing to fit snugly over it. Get a clothes-pin to use as a stopcock to control the flow of water through the tube. Get a cheap thermometer, which can be obtained at any drug store for thirty-five or fifty cents. Attach the catheter to the rubber tubing by slipping the tube over the numbered end, after first breaking off the small wire holders. Make the catheter fast to the tube by tying tight with a stout thread or strong cord, if necessary. Have at hand a gallon of very hot water and a few quarts of cold water. Put into the tin reservoir a quart of water at a temperature of 115°. Release the tube by removing the stop-cock, and let a small quantity of water run through the tube until it becomes warm. Oiling the catheter, replace the stop-cock, and carefully pass the catheter into the urethra, gradually pushing it farther back until it is very nearly into the bladder, or has passed beyond the point of greatest soreness. Now release the stop-cock, and allow the water to run through the tube into the ure-

thra. The tube being smaller than the canal, the water will return, forcing its way along outside the catheter, and may be received into a convenient vessel on the floor while the patient sits upon the edge of a chair. The reservoir must, of course, be raised to a sufficient hight to give proper force to the stream. The force should not be too great, as the water may be driven back into the bladder. The catheter should be very carefully used, so as not to injure the canal, which in its inflammatory state is very sensitive. In some cases, the catheter can be more easily passed if the water is allowed to run while it is being introduced. After continuing the douche for three to five minutes, add to the reservoir another quart of water at a little higher temperature, say 110° or 115°, and gradually increase the temperature of the water until it is as hot as can be borne. This can be conveniently done by means of an alcohol lamp under the tin pail, allowing it to gradually heat the water as it runs out.

The douche should be continued for fifteen minutes to half an hour, and a temperature of 120° or 140° will be perfectly well borne if the increase is very gradual. The hot douche may be taken two or three times a day, and may be prolonged, if it is found necessary to give relief, to one hour each time. Hot flaxseed tea may be used in place of hot water, and from its lubricating qualities, has some advantages over pure water. This treatment prevents the high degree of inflammation which gives rise to exudate in the tissues about the canal, causing chordee, and is one of the most effective means of relief of this painful condition with which we are acquainted.

Another excellent means of relieving chordee and pain in the penis, is the hot spray, or hot sponging of the parts. This may be administered by pouring hot water through a common collander, held over the parts, or the water may be applied by means of a large sponge, dipped in hot water and squeezed over the organs.

The warm sitz bath, temperature 95° to 100°, may be taken daily with advantage. The bath should be continued for twenty or thirty minutes, and after the bath the patient should be wiped dry, and go to bed, covering

up warm in order to avoid taking cold. When urination is difficult, the urine may be passed in the sitz bath, often without pain, though quite impossible at other times.

Bubo, or inflammation of the glands in the groins, sometimes results from neglect to rest as directed, the inflammation being transmitted through the lymphatics to these parts. When this symptom appears, a person should consider rest in bed imperative. He should apply hot fomentations over the painful lumps, continuing them fifteen or twenty minutes, three or four times a day. If necessary for relief, the hot applications may be made continuously, or thick poultices of linseed may be employed.

In conclusion, we would warn the sufferer from this disease against the use of strong and irritating injections. An infinite amount of mischief has been done by the use of strong solutions of nitrate of silver, sulphate of copper or blue vitriol, and similar irritating drugs. While it is undoubtedly the case that these substances sometimes produce good results, they so much more frequently aggravate the disease that their use is to be unreservedly condemned. The best specialists long since discarded them. If other injections than simple hot water are to be employed, which we think unnecessary in ordinary cases, they should be very mild indeed. They may consist of sulphate of zinc or nitrate of silver, but should never be stronger than half a grain to a grain to the ounce of distilled water. A better preparation for use in these cases is the distilled extract of hamamelis, one part to three of water. We would repeat, however, that we consider these injections of very little account, and have for some time almost entirely discarded their use in favor of the hot water injections employed as described.

A word of caution should be added respecting the use of the syringe, in case injections are employed. There is great danger that harm may be done by the use of this instrument. A syringe with a nozzle should never be used. The only form of syringe proper for use is one made with a conical end, the orifice being placed in the meatus, and kept in position by pressure while the injection is made into the canal. Syringes with long nozzles

become a source of infection, carrying the disease backward from the anterior extremity of the canal, and often producing serious injury by rubbing off some portion of the inflamed and sensitive membrane. The fluid should not be injected with such force as to project it back into the bladder; but the whole urethral canal should be filled, and the fluid brought in contact with every part by carefully rubbing along the course of the urethra while the fluid is retained, keeping the syringe in position after the injection has been made.

Gonorrhœa Ophthalmia.—A person suffering with gonorrhœa will sometimes, through carelessness, communicate the disease to the eye, causing most virulent inflammation, which may result in destruction of sight. In such a case, a thorough and competent oculist should be consulted at once.

Gleet.—As has already been explained, the disease particularly known by this name is that characterized by a milk-and-water discharge from the urethra, unaccompanied by symptoms of inflammation or any considerable degree of irritability. The disease is commonly the result of an incomplete cure of gonorrhœa, of which it constitutes the fourth stage. It is held by some specialists that when gleet exists, a stricture is always present. The urethral contraction may be very slight; it may, indeed, consist of so slight a degree of narrowing of the canal that an ordinary examination would not reveal its presence; and yet it is sufficient to prevent proper cleansing of the canal, and to cause the retention of the secretion, thus perpetuating the disease. In some cases, the discharge is maintained by chronic inflammation of some portion of the urethra. It is almost always to be found at one end or the other of the canal.

It is held by some that the disease is not contagious; but from observation as well as the testimony of eminent physicians, we believe this disorder to be thoroughly contagious. While it may sometimes exist in so mild a form that it will not be communicated, a gleety discharge, when present, may at any time be aggravated by cold, excessive venery, or other causes of irritation, to such an extent that it will become highly contagious, and may excite a virulent gonorrhœal inflammation.

Several eminent specialists in the diseases of women have recently pointed out the fact that married women frequently suffer with obscure and very obstinate diseases of the womb and ovaries, which evidently arise from infection received from their husbands, who before marriage had suffered with gonorrhœa, which they had supposed was cured.

A man who has suffered with gonorrhœa has no business to marry while there is the slightest degree of discharge remaining.

Treatment.—The hot urethral douche, sitz baths, and mild astringent solutions are as useful in the treatment of gleet as in gonorrhœa, although their use must be more persistent, very much longer time being required to effect results than in the acute stages of the disease. A case of gleet of three years' standing, under the author's care a year or two ago, was cured in three weeks by the hot urethral douche alone, with sitz baths, restricted diet, and attention to the general health, and the disease did not return. Every case will not yield as promptly to treatment; but persevering use of the measures named will effect a cure in all cases except those in which stricture exists.

In a large proportion of these cases, however, there is undoubtedly some degree of narrowing of the urethral canal, even when the patient himself is not aware of the existence of the stricture, having no difficulty in passing urine, though there may be diminished force of the stream. In these cases it is, of course, essential that the stricture should be removed as the first step toward a permanent cure; when, if the directions given are followed, the patient will rarely fail to make a speedy recovery.

CHANCROID, OR SIMPLE VENEREAL ULCER.

This disease, formerly confounded with true syphilis, is wholly local in character. It consists of an eating ulcer with a soft base, from which it is termed *soft chancre*, and is distinguished from the primary sore of syphilis, which has an indurated base, and is known as *hard chancre*. The ulcer is very active, eating rapidly,

and often destroying a great amount of tissue in a short time. Soft chancre generally occurs upon the foreskin, which usually shows two or more sores. In this respect, also, it differs from hard chancre, the initial lesion of syphilis, which usually occurs singly. Soft chancre has no period of incubation; the sore makes its appearance within a few hours after exposure. In very rare cases, several days elapse after exposure before the ulcer is discovered. When not promptly and thoroughly treated, the ulcer proceeds until the most horrible sores imaginable result. Quite frequently, what is known as *buboes* are produced. These are due to inflammatory enlargement of the lymphatic glands of the groins, which are sometimes converted into dreadful abscesses. The first symptom of the formation of buboes is pain in one or both groins, which is greatly aggravated by exercise. Examination of the part shows one or more glands enlarged and tender. In a short time the swollen tissues become red; and after a longer or shorter period, an abscess is formed. As soon as the bubo softens, it should be opened. Time is lost and damage done by waiting for it to open of itself. Phimosis, paraphimosis, and balanitis are among the painful complications of this disease. Sometimes the disease becomes chronic, a form of malady which is recognized as incurable, and which ultimately results in the patient's death.

Soft chancre is distinguished from the initial lesion of syphilis by the peculiarities mentioned, by a very profuse discharge, by the rapidly destructive character of the ulcer, which has a punched-out appearance, its edges being undermined, and by the fact that if a little of the discharge is transported to a raw surface on some other part of the body, another sore may be produced. It should also be added that soft chancre is unaccompanied by constitutional symptoms, except such disturbances of nutrition as arise from the deleterious effects of the pain accompanying the discharge.

Treatment.—The patient's diet should be exceedingly simple, free from meat and stimulants. He should eat but twice a day. Eating suppers is apt to produce painful erections at night. The bowels should be kept open

by the free use of fruit and grains, and the enema if needed.

The first thing to be done in the line of treatment is cauterization of the sore. This may be done by applying pure sulphuric, nitric, or carbolic acid. The application should be made with a pointed stick, and should be sufficiently thorough to destroy all the diseased tissues, and extend into the healthy tissues around the edge of the ulcer about one-eighth of an inch. The effects of the cauterization depend entirely upon its thoroughness, as the smallest point of diseased tissue not destroyed is sufficient to cause a reappearance of the disease, and more extensively than before. The action of the caustic may be checked at any time by the application of a little soda. After the application of the caustic, the parts should be kept carefully protected by lint. The ulcer should be cleansed two or three times a day, a little iodoform sprinkled upon it, and a new dressing applied.

If there is much pain, it may be quite readily relieved by the hot bath, or by sponging the parts with hot water. Great care must be taken to prevent the contagion from extending to other parts of the body, as it is contagious upon the same individual as well as upon others.

If buboes make their appearance, hot fomentations or poultices should be applied, until they are either absorbed or softened. When softening occurs, they should be promptly opened.

A person who has the misfortune to contract this disease, should place himself in the hands of a physician at once. The above suggestions are made simply to indicate the rational mode of treatment, and thus place the patient upon his guard against the impositions which are often practiced by quacks and ignorant pretenders who not infrequently inflict great and unnecessary suffering by the severe and improper methods of treatment employed.

SYPHILIS.

This horrible disease is one of the most destructive and ineradicable of all human maladies. It is a constitutional disorder, and so persistent in character that when

an individual has once been affected, it is absolutely impossible to say at any subsequent time that he is wholly free from the disease. Though all the symptoms may disappear, it may still be present in the system in a latent state, ready to break out in some new and perhaps more distressing form when a favorable opportunity occurs by decline of the general health, through the effects of age, or debility arising from some other disease. It may often remain quiet during the lifetime of an individual, but appear in his children as hereditary syphilis, the victims of which present the most pitiable and hopeless aspect of physical wretchedness upon which the eye can rest.

Nothing more is known of the origin of syphilis than has already been mentioned in remarks on venereal diseases in general; but it is commonly believed to be a disease peculiar to man, though both of the other forms of venereal diseases are known to prevail to some extent among lower animals, particularly gonorrhœa, which is not infrequent among stallions that have been allowed to indulge in excessive coitus. It should be remarked, however, that some authorities claim to have introduced true syphilis in dogs and other animals by inoculation with virus from human beings, and a disease has for some time prevailed among the horses of the French army which presents many of the characteristic symptoms of syphilis. The disorder was contracted from a stallion imported from Persia, where the disease prevails to some extent, as is also the case in Syria.

Syphilis is a highly infectious disease. It is communicable, however, only by contact with an individual affected. The contagion may be communicated in many ways besides coitus. Many cases have occurred in which the disease was communicated by kissing. A person suffering with the disease may have active manifestations of the malady in the mouth, and, if so, may communicate it by the act of kissing, provided there happens to be a raw surface upon the lips of the party kissed. Nurses suffering with the disease, communicate it to children, who may in turn communicate it to other persons. On the other hand, syphilitic children have communicated the disease to nurses. This em-

phasizes the importance of care on the part of those who employ nurses. Cases have occurred in which whole families have been inoculated with this terrible malady through the medium of a diseased nurse.

Syphilis may be communicated by contact with diseased articles as well as diseased persons, as the virus possesses a high degree of vitality, and may exist a considerable time independent of the body. Articles of household use, eating utensils, as knives and spoons, pencils, cigar holders, dentists' instruments, cigars made by a syphilitic person, and numerous other articles, may become the vehicle by which this horrible disease is conveyed to innocent and unsuspecting persons. For example: A dry-goods merchant contracted syphilis by putting in his mouth a lead pencil which had been used by a syphilitic clerk. A doctor took the disease from a syphilitic friend through the medium of his pipe. Doubtless, numerous cases of this sort have come under the notice of nearly every physician of experience.

A number of cases have come to the notice of the author, in which young ladies had contracted the disease by receiving a kiss upon the lips from men who were at the time suffering from this destructive disorder. For example: A young lady was accompanied home from a ball by a young man suffering with syphilis, and on reaching home, allowed him to kiss her upon the lips. Two or three weeks later, what she supposed to be a cold-sore appeared upon the lip. Knowing nothing of the nature of the disease, she continued to fondle and kiss her younger brothers and sisters as usual, until the disease was communicated to them. They in turn infected the mother. As the "cold-sore" upon the lip did not heal, a physician was called, who discovered the horrible nature of the disease; but it was too late, and the health and happiness of the entire family was ruined forever.

That this disease is transmitted by heredity from parents to children, is as thoroughly established as its contagiousness. Often, too, the disease makes its appearance in the offspring years after it is supposed to have disappeared in the parent. It is believed by many that scrofula and consumption are, in many cases at least,

simply peculiar manifestations of the inherited virus of this disease.

Symptoms.—The initial symptom of syphilis is an almost insignificant sore, which when fully developed, is known as hard chancre. It is often scarcely more than an abrasion of the surface, accompanied by hardness of the surrounding tissues. The ulcer has little tendency to spread, is very slightly painful, and usually heals up in a short time, even without treatment. The usual location of the chancre is upon the penis; but it has been observed upon other parts of the body, as the anus, lips, tongue, nose, chin, eyelids, and abdomen. The symptoms of syphilis are usually classed under three heads,—primary, secondary, and tertiary. The primary and secondary are distinct. The secondary and tertiary gradually merge into each other, so there is no dividing line between them. The primary symptom, which consists of the chancre, makes its appearance from fifteen to twenty-five days after exposure. For forty-five or fifty days, the chancre remains as the only symptom of the disease. At the end of this time, the general symptoms which mark the secondary and tertiary stages of the disease, become apparent. The patient will notice a slight roseolar eruption, very similar to the eruption of measles, which may be accompanied by a slight soreness of the throat. In four to six weeks later, another eruption, somewhat deeper in color, makes its appearance. The red color after a time assumes a copper hue, and each spot, when it disappears, leaves a copper-colored staining of the skin. Simultaneously with the occurrence of the eruption, white patches, known as mucous patches, appear in the mouth, particularly the back part of the mouth, or fauces, and about the nose.

The secretion from mucous patches, as from other of the various manifestations of the disease, is very contagious. It is through this means that the disease is communicated by kissing. Curiously enough, the normal secretions, such as saliva, milk, tears, etc., have not been proven to be capable of acting as a medium of contagion.

Soon after the appearance of the chancre, or initial

lesion, the glands of the groin may be found to be enlarged. They do not suppurate, however, as in chancroid. This enlargement of the glands continues until the lymphatic glands in various parts of the body may be enlarged, as indicated by small lumps which may be felt by the finger in the axilla under the arm, and at the back and upper part of the neck.

Later on in the disease, manifestations of a more virulent form make their appearance, among which are pustular eruptions, eruptions of the throat and various parts of the body. A form of inflammation of the eye, known as *iritis*, is not uncommon. To these symptoms may be added a long train of disorders too numerous for description or even mention.

After a time, varying from one year to forty years, a still different set of symptoms make their appearance, involving chiefly the bones and hard structures of the body. When the bones are infected, they sometimes enlarge, and undergo destruction. We have seen in the hospitals of this country and Germany, cases in which portions of the skull had been destroyed, in some instances exposing the brain. The bones of the nose are very liable to be affected. At the moment of this writing, we have under observation a case in which the bones in the nose and adjacent parts of the face are entirely destroyed, and the destructive process is still extending deeper into the skull with great rapidity, and with such persistence that nothing can stay its progress. In this case, the patient, an innocent man, contracted the disease from an unfaithful wife. A great variety of diseases of the brain, nerves, heart, lungs, liver, digestive organs, and in fact of every organ of the body, owe their origin to this destructive malady.

In PLATES C, D, and E may be seen some of the results of the disease in the parts of the body shown.

It is generally believed that the disease is contagious only in the primary and secondary stages. It is entirely probable, however, that the malady is transmissible by heredity in all stages.

Treatment.—There has been much discussion and great diversity of opinion respecting the proper method of treating this formidable disease. Originally, it was

thought necessary that every person who had contracted syphilis should be thoroughly mercurialized; and for many years this measure was often employed to such an extent as to render the patient's life unbearable in consequence of the mercurial poisoning, which frequently did greater damage than the disease for which the drug was administered. Many years ago, the eminent Dr. Bennett, of Edinburgh, Scotland, made a careful study of the matter, as the result of which he arrived at the conclusion that mercury was not only unnecessary, but absolutely harmful in the management of syphilitic disorders. He held that syphilis is a self-limited disease. That the system makes vigorous efforts to free itself from the poison which has been introduced, and that it would be just as sensible to try to dry up a small-pox eruption as to give medicine to a syphilitic case for the purpose of causing the disappearance of the symptoms of the disease.

Dr. Bennett holds that the disease can be much more successfully treated without mercury than by its use, and cites not only hundreds but thousands of cases which were treated without mercury, and he claims that it was with much better results than when the drug had been employed. It is noticeable to all who are familiar with the disease that the most horrible phases of the malady are much less frequent than a quarter of a century ago, when mercury was much more freely used than now. At the present time, the administration of mercury is usually in small doses, the effect of which is of course much less harmful than the large doses formerly believed to be indispensable.

Dr. Bennett's idea respecting the influence of mercury upon the disease is, that it simply causes a cessation of symptoms, without curing the fundamental morbid processes which are at work in the body, and by thus checking the remedial efforts of the system, causes the poison to be retained in a latent state, ready to break out again in its various forms whenever provocation or a favorable opportunity occurs. Dr. Bennett seems to establish this point by referring to the fact that relapses are much less frequent among those who have not been treated by mercury than among those are treated in the orthodox way.

From personal observation, we are inclined to believe that mercury is not an essential means of treatment in this disease, although it may seem in many cases to effect a more speedy cessation of the symptoms than would be likely to occur without it. We have treated a considerable number of cases of this sort successfully, and have never found it necessary to administer a single grain of mercury in any form whatever. We have come to the conclusion that the most successful manner of treating syphilis is in the same way that any other disease known to be produced by the impurities in the system would be most properly treated; namely, by eliminative treatment coupled with such measures as will build up the general health in every way possible. Some of the worst cases of the disorder which have come under our notice have been those in which mercury had been very freely used, and was undoubtedly largely responsible for the wretched state in which we found the patients. Dr. Bennett calls attention to the fact that mercury alone will produce many of the horrible conditions which have been attributed to syphilis. He gives in his work a cut of the skeleton of a dog which had been mercurialized, which we reproduce in Fig. 1, PLATE C. Compare the appearance of the bones of the dog with that of the arm bone of a man, shown in Fig. 2 of the same plate, from a patient who died of tertiary syphilis. It is evident to the eye, at least, that the condition is identical; is it not probable that the cause is identical also?

We sometimes employ potassium iodide for the purpose of restraining destructive processes which might result in deformity or great injury, not however with the idea that the drug will act in a curative way, but simply for the purpose of restraining the activity of the poison until it can be eliminated by the natural efforts of the system, the only way in which any disease due to the reception of poison into system can be eradicated. The diet should be simple, wholesome, and easy of digestion. Spices, pepper, and condiments of all sorts should be discarded. The use of tobacco in any form and alcoholics must also be strictly forbidden. The patient must give the best attention to the general health in every way possible.

The initial lesion, or hard chancre, if discovered early, should be cut out, and the sore treated as any other simple sore. Cauterizing with nitric acid, chromic acid, or pure carbolic acid, is sometimes practiced, instead of excision. After removal or cauterization, the disease should be treated as soft chancre. The disease cannot be prevented by cutting out the chancre, even at an early date, as it is not a local affection, but simply a manifestation of the disease, in which the whole body is implicated; but by removal early it is possible that the degree of infection may be to some extent controlled.

If the secondary symptoms of the disease make their appearance, the patient should have the advantages of rest, and protection from danger by taking cold, and an abundance of sunshine and fresh air. Frequent eliminative baths should be taken, such as Russian, vapor, or Turkish baths, two or three times a week. By the aid of this treatment, the eruptions will usually disappear in a short time, and if the eliminative treatment and careful regimen are continued long enough, the tertiary symptoms will not make their appearance. If the patient is very weak, or of feeble constitution, the treatment employed should be such as will improve the general strength. Hot baths should not be administered with such frequency as to have a weakening effect.

Ulceration and other disorders belonging to the third stage should be treated on much the same principles that a similar condition would be treated when arising from some other disease.

Several questions of special interest are connected with this disease, which must receive proper consideration.

1. Is syphilis curable?

This question is often asked a physician who has much to do with patients suffering with this disease. The answer may vary with different physicians, as there is still much diversity of opinion; but the belief in the curability of the disease is gaining ground among physicians, and many who formerly regarded it as incurable, now believe it curable, when sufficient time is allowed. Some

eminent French physicians claim that the disease naturally runs its course in one and a half or two years, by the end of which time the poison is supposed to be entirely eliminated, provided the disease has progressed favorably. This is probably a somewhat too favorable view of the case; but there seems to be no reasonable ground for believing that by persistent efforts the disease may not be finally conquered, and expelled from the system, though the length of time required to bring about this result cannot be stated with any accuracy. Indeed, it is never possible to say of any individual who has had syphilis, that he is wholly and certainly free from the disease. It may be said, in general, that a person who has been contaminated with this fearful poison, should continue the most careful regimen and thorough treatment, not only until every symptom of the disease has disappeared, but for several years afterward. Indeed, the only safety for such an individual lies in a life of the greatest sobriety and pains-taking avoidance of every habit of life which may in any degree undermine the general health. A person who will do this, may feel a reasonable confidence that the horrible malady will be held in check, and perhaps ultimately entirely wiped out.

2. Is it proper for a man who has suffered from syphilis to marry?

This question is sometimes one of the most unpleasant with which a physician ever has to deal; yet it must be squarely met. What shall be said in reply to it? There are usually two things to be taken into account in the case of a person who has suffered from syphilis: *a*. He has been guilty of gross immorality; *b*. He has contracted a disease the duration of which is indefinite, and the curability of which is problematical.

While he may have passed the stage in which it is transmissible by direct contagion, it is entirely possible that the morbid tendency in his constitution may be transmitted to his children. Is such a man fit to marry a woman who is physically and morally pure? Would any man consider a woman whose conduct had been no worse, and whose condition was identical, a fit person for a wife? These are questions which every syphilitic

man should face squarely, and consider fairly. It would be well, indeed, if every man would consider these questions before he becomes syphilitic. One thing we may say without the slightest reserve: A syphilitic man has no business to offer himself as a husband to a pure, uncontaminated woman, without plainly telling her the facts respecting his condition. What man would be willing to see a favorite sister whom he knew to be physically and morally pure, bound to a man who had lived a life of sensuality, and whose body, in consequence, had become contaminated by this most horrible of all human maladies? If you are a syphilitic, and desire to marry, consider that the woman whom you are asking to become your wife is somebody's sister. Consider yourself, for a moment, her brother, and some other man the suitor. What would your advice be to her? Though you may not communicate the disease to your wife, your children may be weak, scrofulous, or syphilitic. Have you any right to bring into the world such unhappy creatures? The children of such fathers swarm the hospitals in every large city.

It is true that children apparently healthy are often the result of such unions; but no man can say at what moment, during the life of such a child, some horrible symptom may make its appearance; and it is well known to experienced physicians that not infrequently, syphilitic fathers beget syphilitic children, even after having begotten one or more children apparently healthy. We leave it for the reader's own conscience and judgment to decide whether the man who contracts syphilis as the result of his own immoralities does not thereby forfeit his right to become the father of children, and the husband of a woman whose body is healthy, and morals uncontaminated.

The author is aware that many physicians do not look upon this matter in the light here presented; and it is unquestionably true that almost any syphilitic who did not at the time suffer active symptoms of the disease, might readily obtain medical sanction of marriage; nevertheless, the author feels justified in the position he has taken upon this point, and would urge those medical men who unhesitatingly sanction the marriage of men

whose constitutions have been thoroughly syphilized, to bring the matter close home to their own consciences, and consider whether the progeny of such men will be likely to be such representatives of the race as ought to compose the generation to come.

In conclusion, we would most earnestly urge young men who read these lines to consider with the greatest seriousness the terrible consequences of vice, and to consider further the fact that all the most horrible physical disasters which can arise from the disease described in this chapter, may be the result of one single departure from the path of virtue.

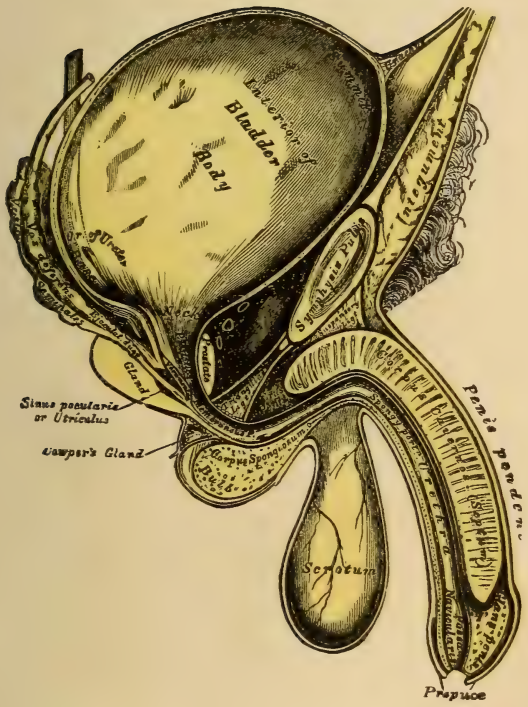

Interior of
Bladder
Body
Integument
Penis pendens
Sinus pocularis
or Utriculus
Cowper's Gland
Scrotum
Prepuce

PLATE A.

Fig. 1.

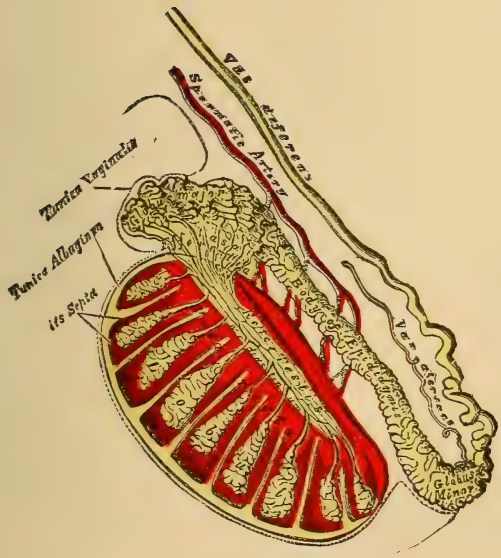


Fig. 2.

PLATE B.—BLADDER AND TESTIS.

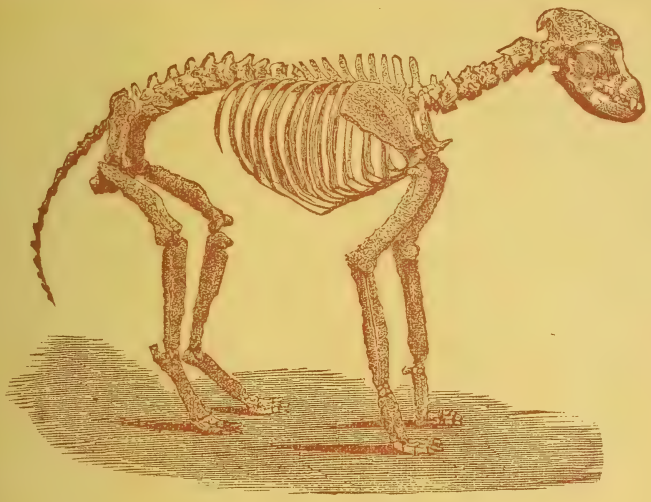


Fig. 1. Mercury.

Fig. 2.

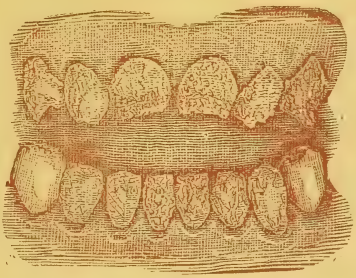


Fig. 3.

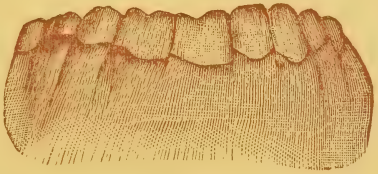


Fig. 4.

PLATE C.—Effects of Mercury and Syphillis.

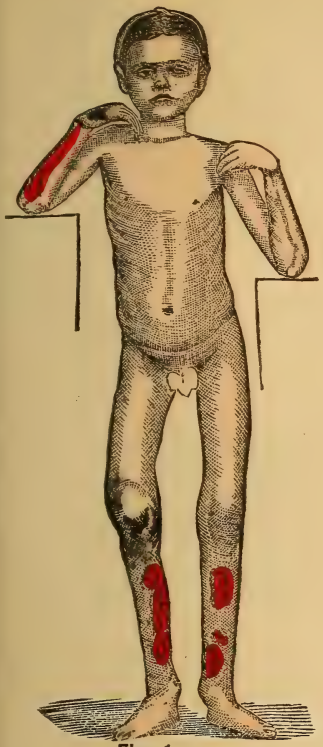


Fig. 1.

Fig. 2.

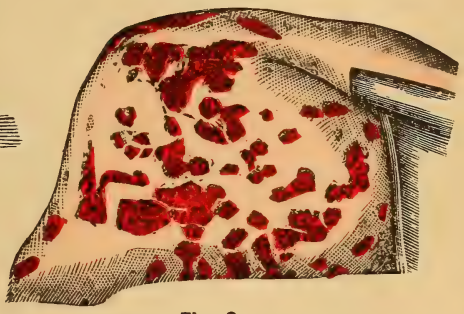


Fig. 3.

Fig. 4.

PLATE D. Effects of Syphillis.

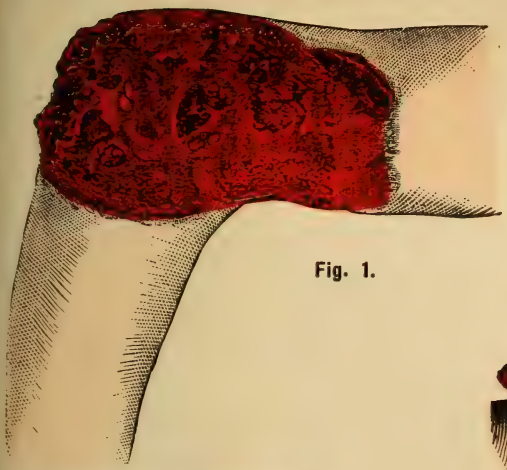


Fig. 1.

Fig. 2.

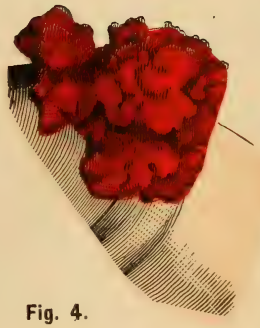


Fig. 4.

Fig. 3.

Fig. 5.

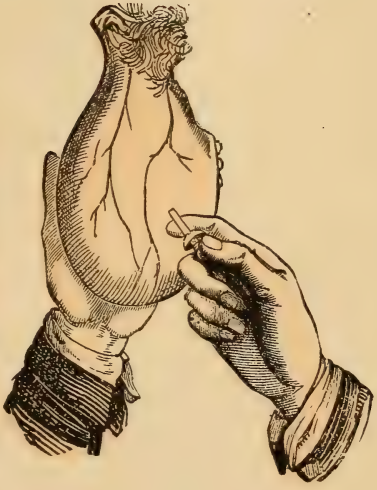


Fig. 6.

PLATE E.

PLATE III.—The Arteries and Veins.

PLATE V.—The Nerves.

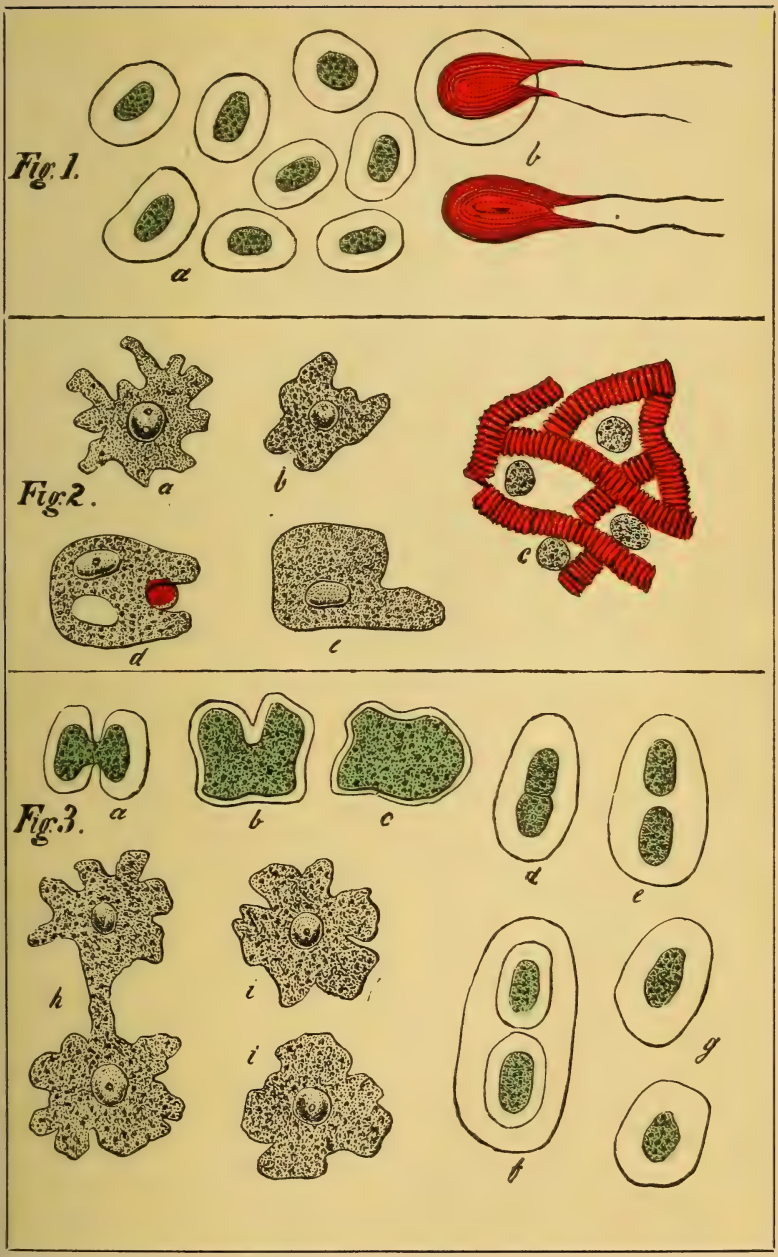


PLATE VII.—Low Forms of Life.

Fig. 1.

Fig. 2.

Fig. 3.

PLATE IX.—Sex in Plants.

Fig. 1.

Fig. 2.

Fig. 4.

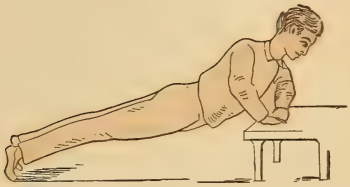


Fig. 3.

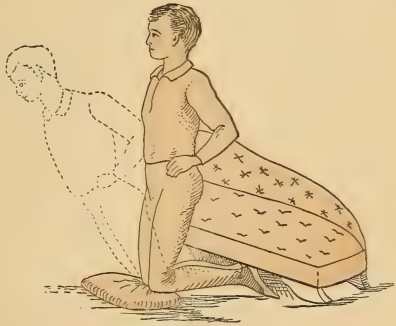
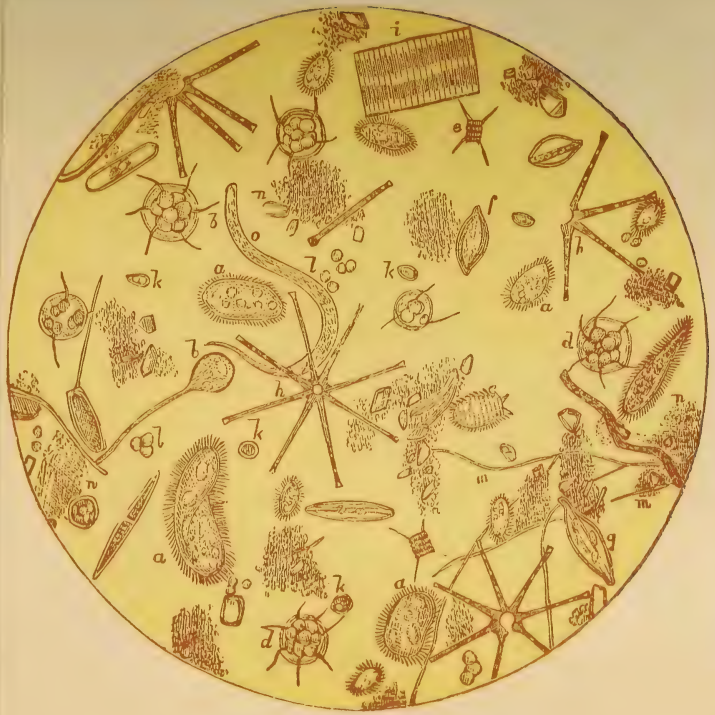


Fig. 5.

PLATE XXII.



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